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Institutional Heterogeneity and Intra-sub-regional Trade

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Abstract

We explore how differences in institutional environment within a region affects the level of trade between countries. We construct a measure of differences in the quality of institutions between countries, that allows us to employ the gravity model of trade in an empirical assessment of the relationship between institutions and intra-sub-regional trade. In this regard, the overall impact of the quality of institutions is examined, as well as the impact of the difference in quality of institutions between trading countries, on bilateral trade within the ECOWAS (Economic Community of West African States) region. The empirical results show evidence of significant negative impact of differences in the quality of institutions on intra-sub-regional trade. We also explore heterogeneity in the effect across member states and find that the negative impact is somewhat driven by, and greater between farther and more populated countries.

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Introduction

The recent push for increased regionalisation in sub-Saharan Africa (SSA) has led to a revisiting of the debate on the positives and potential ills of regional integration. An increasing body of evidence suggests that an increase in intra-sub-regional trade has the potential to induce increased growth for countries in the ECOWAS (Odularu 2009; Akpan 2014, Okoro et al., 2020), in line with the Krugman (1991) assertion. This expected growth stems from export-led economic growth theories, which, in the global context, is well evidenced for (Fosu, 1990; Giles & Williams 2000; He & Zhang 2010; Lorde 2011; Ee 2015), and to a lesser extent in the ECOWAS context (Odularu 2009). While the evidence for the role of increased intra-regional trade in improving economic growth is plenty, research identifying the determinants, and avenues through which intra-sub-regional trade can be improved is sparse. Within the context of ECOWAS, studies have explored geography, openness, as possible determinants (Shuaibu 2015; Zannou 2010). Despite some of these studies, exploring how within-ECOWAS trade can be improved, and the subsequent link to economic growth, not much has been done to explore the role of institutions in intra-sub-regional trade.

In the context of institutional economics, consensus in the literature is that institutions are important for economic growth, however, some of the indirect channels through which this occurs have not been explored. In this case, the role of institutions in determining the extent export-led growth, or more specifically, intra-sub-regional trade (ECOWAS. A common problem that often arises when dealing with the relationship between institutions and economic outcomes, is the abstract nature of institutions, and the lack of a clear conceptualization of the nature of institutions being explored in the study. In this regard, the institutions considered here follow the operating definition put forth by North (1990), which defines institutions as humanly devised constraints that guide human interactions.

Figure 1: Exports by regions from ECOWAS (1960 – 2020)
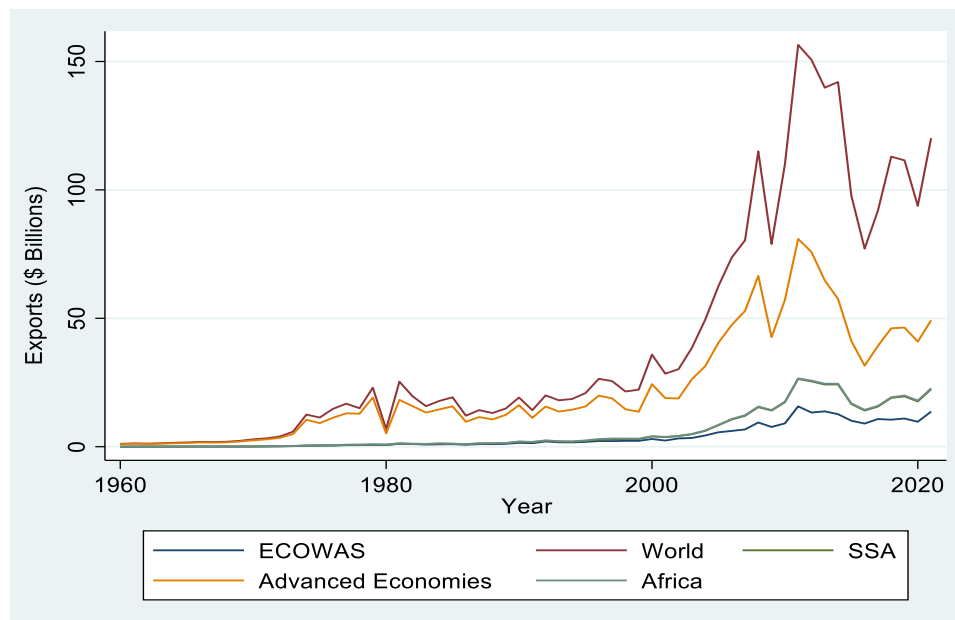
Source: Author's Calculation

That is institutions are rules that help facilitate transactions between humans. Therefore, in the presence of 'good institutions' transactions occur freely, whereas with 'bad institutions', transactions are

stymied. Within this context, the rules that set the guidelines for trade to occur in an uninhibited manner as possible within the ECOWAS becomes pertinent. More specifically, country specific institutional environments that inform negotiations around the terms of trade, and harmonization thereof within ECOWAS will help put the analysis in perspective. The main interest of this paper is whether institutions play a significant role in determining intra-ECOWAS trade, and more specifically, if differences in the institutional environment, or quality of institutions between trading member states have any impact on intra-ECOWAS trade.

Given the wealth of resources in SSA (some ECOWAS countries included), the wealth of human capital, and the potential for growth on the continent, the observed growth and development over the past few decades have been underwhelming. Across many macroeconomic measures and economic development considerations, ECOWAS countries have consistently performed below its potential. More importantly, given the benefits of regional integration (Vamvakidis, 1998; Te Velde, 2011), the low levels of trade within ECOWAS relative to the rest of the world or other regions (see Figures 1, 2, A2 & A2b)

Figure 2: Exports by regions from ECOWAS (2020)
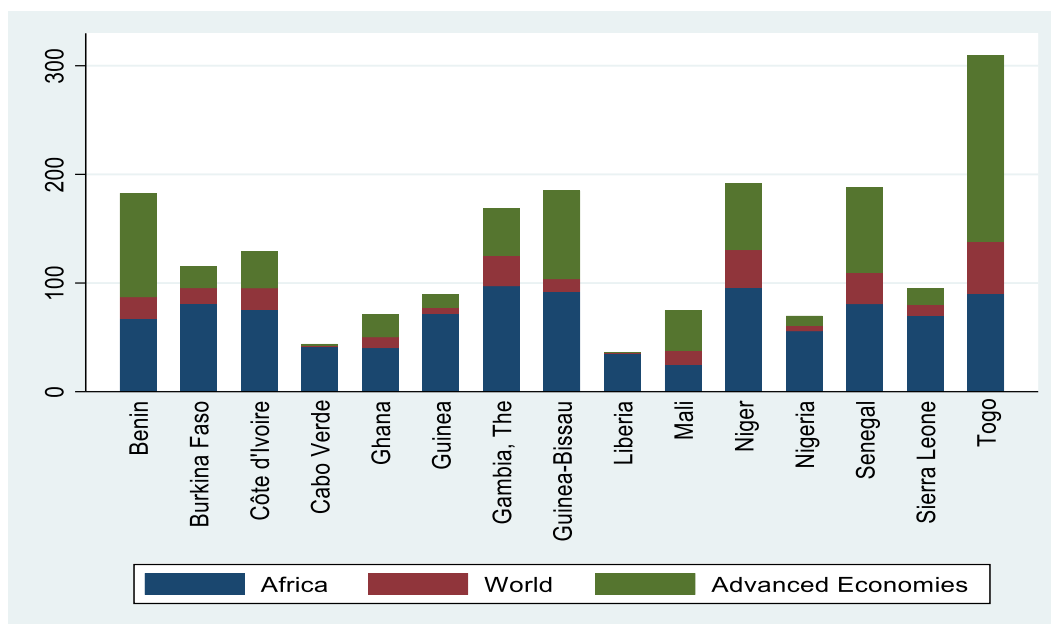
Source: Authors Calculations (IMF DOTS data)

Despite these unimpressive development outcomes in the ECOWAS, trade between countries in the region have steadily increased over the past two decades. Bearing in mind, the initial state of intra ECOWAS was almost negligible, small spurts may be exaggerated in data outcomes. Nevertheless, intra-sub-regional (economic community) trade in Africa is rarely larger than extra-sub-regional trade (to the rest of Africa), as shown in Figures 1 & 2. In a 2019 UNCTAD report, it was shown that ECOWAS ranks 4th of all 8 economic communities, with 56.7% of trade being intra-ECOWAS between 2014 and 2016. Although this 56.7% signals an increase from about 46.6% in the previous period (2010 – 2012) (See Figure 3). There is need for perspective, an example being the 2017 numbers, where intra-regional trade made up 17% of Africa's exports, far lower than 59% in ASIA and 69% in Europe.

Lastly, if the best and worst performing countries, in terms of intra-Africa trade, are considered, none of the ECOWAS member states feature in the best performing (top 10), while 4 feature in the 10 worst

performing countries (Guinea at 1.6%; Cabo Verde at 3.6%; Guinea Bissau at 4.7%; and Liberia at 5.1%). These numbers show that ECOWAS, while improving the level of trade within, still falls behind many of its African counterparts (UNCTAD 2019). Nevertheless, improving trade within ECOWAS will impact on overall intra-Africa trade, while also enabling export-led growth for member states, and the region. How such efforts can be aided or attenuated by the quality of institutions, is the goal of this exercise. That is, how ECOWAS member states are impacted by the quality of institutions and the differences thereof is what this paper is concerned with.

Figure 3: Intra-Economic vs. Extra-Economic Community trade in Africa
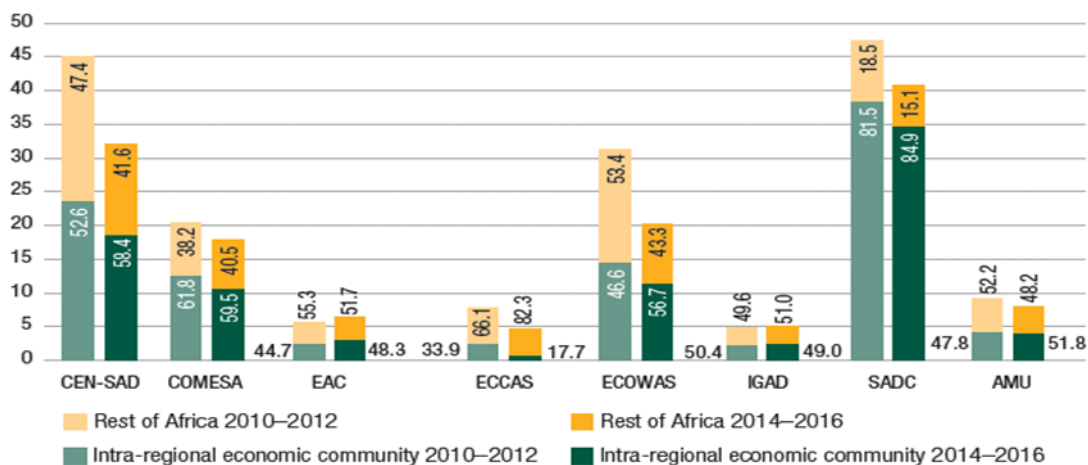
Source: UNCTAD (2019)

The two areas of interest in this paper form pseudo complements in terms of avenues through which the growth trajectory of SSA countries can be turned around. The quality of institutions, both political and economic, are considered as factors that have undermined several developmental efforts, while on the other hand, intra-regional trade is considered a factor through which growth can be engendered at sub-regional levels on the continent. It would hence be beneficial to the literature, and policy, to explore the interrelations between the two factors. That is, do institutions play an important role in determining the extent of intra-sub-regional trade? And if so, is the increasing homogeneity of the quality of institutions in countries within a region a factor? Moreover, given the nature of institutions, and the fact that, while we have quantitative representation of the quality of institutions, they exist along a spectrum, that may not necessarily be linear. Therefore classifications based on institutional environment may give more nuance. In addition, the noisy nature of country-level institutions may lead to institutional variation with underlying covariates. For example, it is possible that countries that export the same category of products or with similar colonial past may be clustered together in terms of their quality of institutions, and thus have different trade implications based on how different they are. Chernozhukov et al., (2018) suggests that, to circumvent this, an exploration of the entirety of effects of the variable of interest vis-à-vis the covariates be carried. This is done by calculating partial effects along the spectrum of institutional differences across trading partners. It is termed heterogenous (*sorted*) effects. This would help understand how variation occurs, even when the relationship that emanates is non-linear. Given the nature of countries across ECOWAS, where it is possible that a few countries with certain specific similarities might be driving the results observed, exploring heterogenous effects may provide necessary nuance to our results.

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Studies have explored similar issues like trade liberalization (Shuaibu, 2015), Exports diversification (Odularu, 2009), geography, remoteness, infrastructure (Akpan, 2014), and their impact on intra-regional trade (in the ECOWAS and some other regions within the SSA). However, the role of institutions as a determinant of intra-regional trade is not well explored. This is fascinating given that political integration is one of the highest levels on regional integration, and as such, it would be worthwhile to see if the convergence from an institutional perspective, has any significant role to play in the extent of intra-regional trade, with a focus on the ECOWAS region. Ideally, to address some of the concerns with the empirical assessment of institutional impact, we would unbundle the measure of institutions into as narrowly definable measures as possible, and use this to tease out specific and narrow institutional channels. Such may help in avoiding some of the noise that comes with institutional measures at the macro level. However, the limited data availability for most ECOWAS countries, prompts us to focus on political institutions. Whereas political institutions have been shown to be main long-run sustainable drivers of economic outcomes (Acemoglu 2012). Arguments specific to the ECOWAS ideals and the political inhibitors thereof, are also suggestive of a more prominent role for political relative to economic institutions (Bach, 1983).

Figure 4: Ratio of ECOWAS exports to total exports, and Institutional gap (2018).
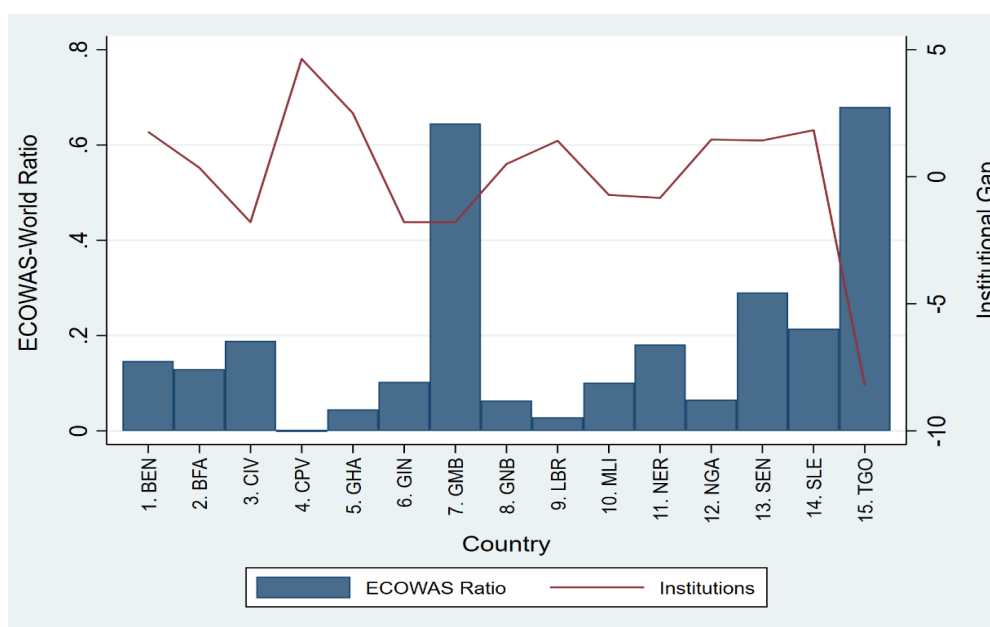
Source: IMF DOTS data set

While there is relative consensus that institutions are important for economic growth (North, 1990; Acemoglu, 2001, Knaack & Keefer, 1999; Glaeser, 2004; Acemoglu, 2013), and exports are important for economic growth (Giles & Williams 2000), in some instances, the role played by institutions is an indirect one. That is, institutions may impact exports, which in turn significantly impacts economic growth. The nature of bilateral trade allows for an innovative way to explore this relationship, by focusing on the gap in the quality of institutions between two trading partners. We graph the two variables of interest in Figure 4, for the 2018 (the last available data point). The average gap in the quality of institutions between each country and other countries in the ECOWAS seem to have some form of correlation with the total amount of relative export to ECOWAS countries. Although it is possible this might be driven by some things other than institutions. Like in the case of Cape Verde, the ECOWAS trade relatively negligible, whereas the institutional gap also seems to be highest. The fact

that Cape Verde is the only country without any British or French colonial history may have a lot to do with this. Thus, prompting the need to incorporate gravity features in this analysis.

The rest of this paper is organized as follows: The next section provides a brief overview of the ECOWAS, Institutions, and intra-regional trade; Section 3 will give a brief overview of the gravity model and the data set used; Section 4 presents the models, results and discussions; and in Section 5, the paper is concluded.

ECOWAS & Institutions

ECOWAS

Figure 5: Exports from ECOWAS-to-ECOWAS countries
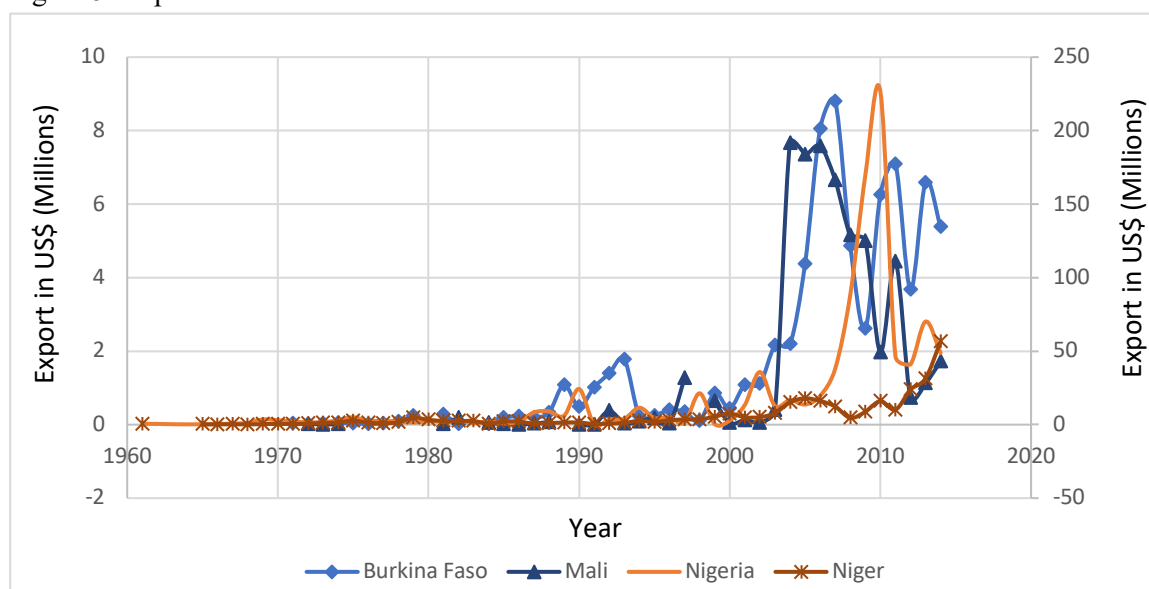
Source: IMF DOTS data set. * Nigeria and Niger are measured on the right axis.

ECOWAS, founded in 1975, is a group of countries in West Africa. It consists of a total of 15 countries, namely: Benin, Burkina Faso, Cape Verde, The Gambia, Ghana, Guinea, Guinea Bissau, Ivory Coast, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo. The formation of the ECOWAS came on the backdrop of *the ECOWAS treaty*, that was signed in Lagos in 1975. The overall objective of the ECOWAS is to foster economic integration between member countries. Integration in this context cut across several areas, including categories such as industry, transport, energy, agriculture, services, infrastructure, monetary issues, socio-economic issues, etc. With a majority of the countries already sharing language, currency (CFA Franc), state of development and high levels of human capital/labour, the formation of and facilitation of region economic, monetary, and political integration between the countries, presented an opportunity for economic relations that would foster collective growth for all.
The ECOWAS like many other ambitious regional economic integration agreements across the continent, has failed on numerous occasions to meet integration targets set by member states. This led to the revision of the ECOWAS treaty in 1993, in attempts to speed up the process of integration. Further initiatives to achieve higher levels of integration have occurred since then. The most deliberate being the establishment of the Vison 2020 in 2007. This has achieved tangible results, with the easing of movement between ECOWAS member countries, through the introduction of the ECOWAS passport. In response to these efforts by the ECOWAS, there has been significant improvement in intra-ECOWAS trade over the past decade (See Figures 5, A2, & A3). While overall, as depicted in Figures

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1 & 5, most ECOWAS member states still have more extra-Africa than intra-Africa trade, the improvements have been visible. However, other sub-regional agreements may threaten the improvements, as many of the ECOWAS French speaking countries are also members of WAEMU (The West African Economic Monetary Union).[1] As is often the case, overlapping membership in regional economic blocs and agreements, present possible conflicts and challenges of its own (Davis, 2009; Sopranzetti, 2018).

Figure 6: Exports from ECOWAS-to-ECOWAS countries
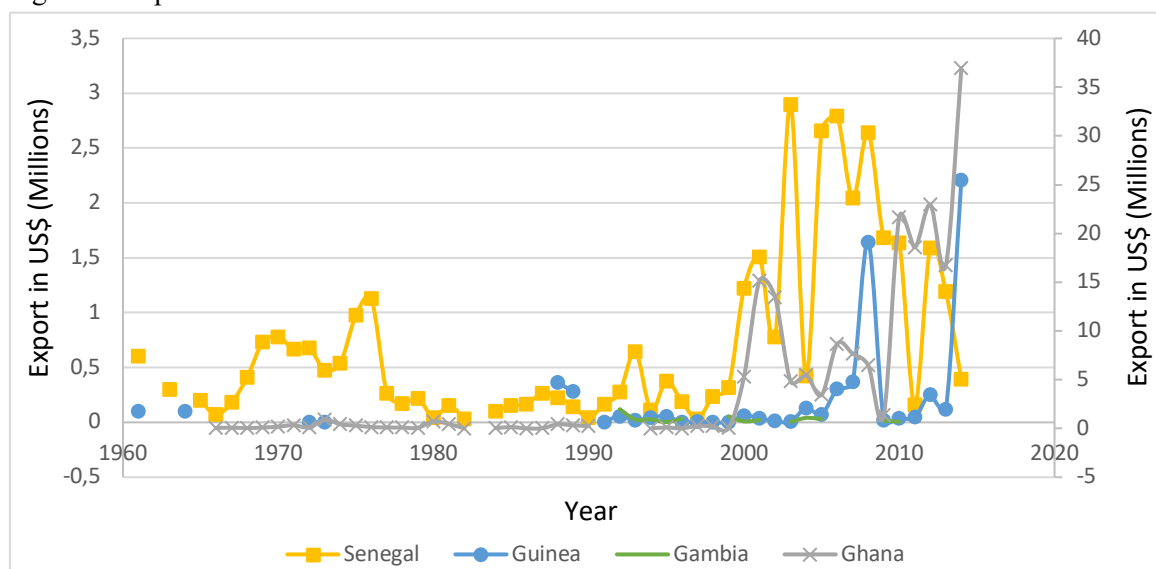
Source: IMF DOTS data. * Ghana is measured on the right axis

The present achievements (or non-achievements) of the ECOWAS can be linked to a number of issues, some not peculiar to ECOWAS as an economic community alone. In a 2019 UNCTAD report, the main causes were found to be weak productive capacities, tariff related trade cost, and non-tariff barriers. With regards to tariff related trade costs, ECOWAS has one of the highest within community tariffs at 6%, in comparison to 4% for the SADC, 2% for COMESA, and 0% for the EAC (UNCTAD 2019). Thus, ECOWAS, unlike some of the other economic communities in Africa may be hindered by such relatively high tariffs. Ideally, the exploration of this relationship should, by these suggestions, start from the tariff frons. However, measures of tariffs at the national level if not weighed can overestimate the tariff levels at the national level. Whereas when weighted, national level tariffs can lead to an underestimation, in the presence of extremely adversely affected products, due to the endogeneity of the method. Thus, incorporating tariffs in such an analysis would need to be done at a disaggregated products or industry level.

Institutions and intra-sub-regional trade

The new institutional economics (NIE) provides an alternative way to explore some of the issues that have plagued SSA from an economic growth and development perspective. While this area of research has been very innovative, there are pertinent issues that often lead to empirical issues. One such concern is the often abstract-like approach to institutions. In many cases, it is not clear what studies refer to as

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[1] Benin, Burkina Faso, Ivory Coast, Guinea Bissau, Mali, Niger, Senegal, and Togo, are all members of WAEMU. In addition to this, Guinea Bissau, Liberia, and Sierra Leone, Ivory Coast, are also members of another agreement (MRU- Mano River Union).

institutions. In addition to this, there is a tendency to employ institutional measures that are composite, rather than unbundled, especially in cases where such unbundled characterisation of institutions are available. Lastly, the lack of extensive data on the quality of institutions have limited most analysis of the institutions and economic outcomes nexus to cross-country studies, with only a few within country studies. This last limitation is more pronounced for SSA countries.

In as far as the relationship between institutions and intra-sub-regional trade is concerned, there is not much evidence in literature. This may be due to the competing nature of the role played by institutions and international trade in explaining economic performance (See Dollar & Kraay, 2003; Herger et al., 2008). However, in the few studies that have examined the relationship, they often found a positive relationship (Meon & Sekkat, 2007; Souva et al., 2008; Segura-Cayuela, 2006). Some have found evidence of negative relationship, depending on the nature of exports considered. For example, while Meon & Sekkat (2007) found a positive relationship between institutions and exports of manufactured goods, the same was not true for non-manufactured goods or total trade. Yu (2010), in a panel analysis of 157 countries found evidence supporting a significant impact of democracy on trade. In some cases, the outcome was inconclusive (Anderson, 2008). That there are no studies specifically looking at intra-regional or intra-sub-regional trade and the role of institutions, highlights the need for empirical investigation in this area.
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Theoretical Framework

Institutions and Trade

North (1990) defines institutions as humanly devised constraints that shape human interaction. They are rules of the game within a market/society aimed at structuring incentives in human exchange. North further deliberates on institutions from a *transactions* costs perspective, whereby, in the presence of good institutions, there is greater incentive, or lower barriers (transactions costs) to economic interactions between economic agents. This same conceptualization can be extended to the macro, national, or economic community level, to conceptualize interaction between and across countries. In the presence of good institutions, economic transactions (trade) between countries tend to take place more smoothly, and hence occur more frequently, than when bad institutions are in place.

At a more nuanced level, a few avenues through which good institutional environment can impact trade exist. For example, Barro (1996, 1999) and Rodrik (2000) argue that good institutions lead to the creation of fair and competitive, and freer markets, which in turn lead to strongly regulated regimes, that ensure high quality products. Such products are more attractive in the international markets. The contrast is poorly regulated trade markets, which brings about insecurity that cause some form of hidden tax on imports/exports (Anderson and Marcouiller, 2002). Using a different conceptualization, Mehlum et al, (2004) explore the role of institutions as one where good institutions promote productive activity, while bad institutions promote rent-seeking (or non-productive activities). Therefore, in a country where the market rewards productive activities, individuals within that system become experts and flourish at being productive. Whereas, the opposite would be true for a system that rewards rent seeking. Hence in the presence of good institutions, productivity rises, leading to innovation, and increased variety of goods, which tends to promote export demand.

In considering the second objective of the study, whereby the difference in quality of institutions between trading partners are thought to matter for volume of transactions between them. In the same manner that good quality institutions result in strict regulations, low quality of institutions may lead to less and lax regulations, which can lead to poor quality products. However, because of the low quality

(or difference in quality of institutions between countries), there aren't strict regulations that prevent the inflow of low-quality products from the exporting to the importing countries. For example, it is not uncommon to find low quality exports being accepted in many developing countries with poor quality institutions. In this sense, in the presence of similar state of institutions, two countries may be able to engage in trade, as within such a system, activities that subscribe to the similar institutional environments, get rewarded. Lastly, it is also possible that resource rich, but capital poor countries, may have elites that favour trade, but object to improved institutional quality, due the revenue loss that may arise from stronger regulations (Yu, 2010). Within such an arrangement, it is likely that countries that have no objections to the domestic institutional environment (however "bad" it may be), will end up trading with such a country. This raises the endogeneity concerns. However, the fact that the domestic economies, even if they may have influence over the institutional environment in one or two trading partners, such that, similar governance structures are implemented, are unable to do this across a whole region. Moreover, if one major player is able to achieve this, other smaller economies would not have the same ability, thus allaying some of the endogeneity concerns previous studies have had to contend with.

Gravity Framework

At a fundamental level, the gravity model espouses on the idea that trade volumes are determined by the income levels of two trading partners. That is, higher income countries are drawn to trade by GDP-induced gravitational pull (Depken II and Sonora, 2005). Thus, from a very simplistic perspective, the gravity model is based on the assumption that the level of trade is proportional to the output level of trading partners (Yu, 2010). Given the nature of bilateral trade analysis, where each interaction between all potential trade partners is being analysed, the gravity model is apt. The method borrows from Newtons law of gravity, by making use of distance and space/volume in its analysis. This approach was first developed in the seminal papers by Tinbergen (1962) and Poyhonen (1963), and later theoretically conceptualised by Anderson (1979). The oft used empirical specification put forth by Mátyás (1997), informs the specification used in the paper. Deriving its strengths from its ability to order the vast observed variation in interactions across space for both factors and trade.

To incorporate institutions as a determinant of exports into the gravity model, this paper adopts the theoretical proof provided in Yu (2010), where a constant elasticity of substitutions (CES) production function is modified to incorporate institutions in the form of democracy. In this setup, each country (from $i, \dots j$) produces a wide variety of a unique products from K industries. Such that, there are N_{ik} commodities available from industry $k \in K$. This is well represented in the CES utility function below:

$$U_j = \sum_{i=1}^{j} \sum_{k=1}^{k} \sum_{h=1}^{N_k} \left[f_k(z_i) C_{jk}^h \right]^{\frac{\sigma-1}{\sigma}}, (\sigma > 1)$$

In the above equation, C_{jk}^h is the total consumption in country j, from k industries, with h commodity varieties. z_i is the quality of institutions in the corresponding exporting country. The model assumes that the quality of products from any particular industry k, is increasing in z_i, as denoted by the function $f_k(z_i)$, which captures the quality of products from the exporting country. This function that captures the exporting country's institutions and quality of products, is assumed to be exponentially increasing in institutions. The assumed exponential increase is condition on the basis that $f_k(z_i) = \theta_{ik} exp(z_i)$, where θ_{ik} represents the responsiveness of the product quality to institutional quality change. Therefore, the CES production function is modelled for country J, maximizing its aggregate utility

function, which is strictly increasing in the quality of institutions. Yu (2010) further solves this for the representative consumer with income constraints, to obtain the institutions-dependent bilateral industry exports given by $X_{ijk} = N_{ik}Y_j(p_{ijk}/P_j^k)^{1-\sigma}[\theta_{ik}exp(z_i)]^{\sigma-1}$, which is based on fixed quality-adjusted prices. This is then solved to show, among other things, including the dependence of bilateral trade on importing country's GDP within a gravity setup, that industrial bilateral trade depends on the trading countries' democracy levels.

Data & Methodology

We employ the gravity model for trade in the analysis. The data used is obtained from multiple sources. Data on national accounts, such as GDP, population, exchange rate, were all obtained from the PENN world tables (Feenstra et al. 2015). Data on bilateral trade were obtained from the International Monetary Fund (IMF), Direction of Trade Statistics (DOTS) data set. These variables include trade flows from each member country. Data for the gravity variables such as distance between countries, common language, contiguity, were all obtained from the CEPII (*Centre d'Etudes Prospectives et d'Informations Internationales*). Lastly, the data on quality of institutions were obtained from the Polity V data set.

Variables used for the analysis are: real gross domestic product at constant 2005 national prices in million dollars (RGDPNA); population in millions (pop); exchange rate in national currency per US dollars (xr); contiguity (Contiguity); distance between the centre point of the exporting country to the importing country (Distance); common language, institutions; difference in quality of institutions between exporting and importing country (institutional gap), bilateral trade in exports from exporting country to importing country (outflow).

In terms of measuring institutions, the polity IV being one of the most commonly used measures of institutions in the literature, is used[2]. It captures the political atmosphere, and is scored on a scale of -10 to 10, with -10 signalling lack of political freedoms, and governance, while 10 signals the presence of a good polity, protection of political rights etc. For more details on how this is constructed, Marshall et al. (2020) should be consulted. Of key interest to this study are elements of institutional environment that have potential implications for the extent of trade. For example, the polity V data was constructed with three salient polity issues in focus in terms of the stability and dynamics of a regime: executive recruitment, executive constraints, and political competition. We consider the last two, in addition to the overall polity measure, as well as sub-measures of autocracy and democracy. These are political institutional concepts, that are in some sense, relatively broad, but also within which, alignments with countries in a similar institutional environment can be forged for better economic interactions, and hence integration.

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[2] Three proxies were considered in this study, namely: Polity V (with sub-indicators considered as well), freedom to trade internationally, and economic freedoms. Both trade freedoms and economic freedom variables were obtained from the quality of government (QoG) data sets, which is a constructed by researchers with a focus on concepts related to quality of government, transparency, and public administration. The data is constructed from a survey carried out by the QoG institute, through a survey of experts on public administration around the world. Specifically, the economic freedom of the world index is founded on objective components which reflect the presence (or absence) of economic freedom within a country. There are a total of 21 components assessed, that make up the score. The score ranges form 0 - 10, whit 0 representing little economic freedom, and 10, high economic freedom (Dahlberg et al., 2021; Teorell et al., 2021). Similarly, the freedom to trade internationally (current) is scored from 0 – 10, with 0 representing low trade freedoms and 10, high trade freedoms. The index is measured objectively based on five components (Dahlberg et al., 2021).

Institutional Gap

The exploration of potential role for the gap in the quality of institutions is based on the idea of convergence, which is often associated with growth analysis, and the movement together of per capita income of countries (or different economic strata such as provinces, states, or cities), towards a steady state. In this paper, the theory of convergence is used as inference and applied to the process of institutional change across countries. Given the very nature of convergence (conditional or unconditional), speaks to the movement of countries towards a steady state of growth, the nature of institutions fits the same narrative, albeit in a limited form. Institutions cannot grow indefinitely, this is, institutions are not continuous, and it is possible to attain full achievement of institutional quality.[3] While this approach borrows from the growth convergence methodology, the institutional gap and its impact on the level of intra-regional trade is the utmost focus. In this regard, the model to be estimated will include the difference in quality of institutions.

Endogenous Institutions

Much of the institutional economic literature, and the empirical application thereof have identified a few avenues of endogeneity when exploring the impact of institutions on economic outcomes. This can stem from the measurement methodology employed in constructing the institutional indicators. That is, the current state of country based on media or popular opinion, may influence the objective assignment of scores for institutional quality. It could also come about due to the empirical methodology. For example, the fixed effects approach may be hampered by endogeneity, in that, countries that tend to trade more frequently with each other, seek to have similar quality of institutions, or governance structures that align well with each other over time. For example, western countries often influence the promulgation of liberal laws that are tied to admission into preferential trade agreements. In addition, the fact that they all fall within the same regional economic community, with desires for long-term integration including economic, monetary, and political, they may effect institutional changes similar to their trading partners, to implicitly facilitate this process. In such a case, unobserved heterogeneity would be introduced into the analysis, leading to an endogeneity bias. The methodological approach to this study helps circumvent this endogeneity issue, given that, the independent variable of interest is the difference the quality of institutions between countries. It would be impossible for a country to navigate its quality of institutions in such a manner that its well aligned to that of all possible trade partners. Meanwhile, within the ECOWAS regions, the relatively similar size of many of the countries, (except for Nigeria), means the level of influence any particular country may have on the evolution of institutions in another is limited. Therefore, the issue of endogeneity should not be as relevant in this study. Nevertheless, checks are made to ensure this presumption holds true. Specifically we use the method of Oster (2019) to examine the sensitivity of our estimate to unobserved factors.

Empirical methodology

The main advantage of the gravity model stems from its ability to infer trade costs in a setting where such impediments to trade are often not observable to the analysts. As such, it makes it possible to tease out, with relative accuracy, the relationship between bilateral trade and other macroeconomic phenomena (Anderson, 2011).

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[3] It is possible that the assessment of the full possibilities of institutional quality is limited to the knowledge of such possibilities in the present, without accounting for future concerns.

The econometric specification of the gravity model, following Mátyás (1997), takes the form:

$$\ln EXP_{ijt} = \alpha_i + \beta_j + \gamma_t + \theta_1 lnY_{it} + \theta_2 lnY_{jt} + \theta_3 Dist_{ij} + \theta_i Z_{it} + \theta_{i+1} Z_{jt} + u_{ijt} \qquad (1)$$

where:

EXP_{ijt} is the trade flow or volume of trade from country i to country j at time t; Y_{it} is the GDP of the exporting country i and Y_{jt} is the GDP of country j both at time t. Z_{it} and Z_{jt}, are both vectors of control variables for country i and country j respectively, all at time t. $Dist_{ij}$ is the distance between country i and country j. α_i, β_j, and γ_t are domestic (exporting), target (importing), and time effects respectively. For this paper, the specification will include the variable of interest, which is institutions, as shown in equation 2 below:

$$\ln EXP_{ijt} = \alpha_i + \beta_j + \gamma_t + \theta_1 lnY_{it} + \theta_2 lnY_{jt} + \theta_3 Inst_{ijt} + \theta_5 Dist_{ij} + \theta_i Z_{it} + \theta_{i+1} Z_{jt} + u_{ijt} \qquad (2)$$

The vectors Z_{it} and Z_{jt}, include the variables exchange rate and trade liberalisation. While in addition to distance, as a gravity measure, measures for contiguity and common language are also included. Lastly, and most important for this study, the gap in the quality of institutions is captured by $Inst_{ijt} = Inst_{it} - Inst_{jt}$ for each country pair in the data.

There are a number of estimating techniques that can be used with the gravity model. It can be estimated using ordinary least squares (OLS) in the cross-sectional form, or in a pooled form. However, OLS will give biased estimates due to the inability to cater for heterogeneous behaviour of countries (Cheng & Wall, 2005; Zannou, 2010). We thus use the fixed effects approach to estimate the relationship between institutional gap and trade inflows. We assume that institutional gap between two countries is exogeneous and the fixed effect regression control for country pair fixed effects (as against country fixed effects). The assumption that institutional gap is exogenous relies on the gap being a function of institutional environment in two countries. While institutional values for individual countries can be endogenous the gap is unlikely to be endogenous since it depends on institutional values for other countries.

However, using fixed effects means that parameters on gravity variables are not reported since they are time invariant for country pairs. An OLS can still be estimated by accounting for heterogeneity across countries, through controlling for country fixed effects. In addition to this, time effects will also be accounted for, to address potential changes only attributable to time, and rather than changes in the covariates of interest. In essence, it would be a fixed effects estimation being carried out. This is important for our analysis of heterogeneous effect since it allows for examination of heterogeneity that is based on time invariant variables using the sorted effects methodology. For the heterogeneous effects we use the method of Chernozhukov et al. (2018). The method estimates heterogeneous effect based on nonlinear models; it also allows for classification analysis which compares characteristics across the distribution of partial effects. The key insight of this approach is that the (average) partial effect reported by the fixed effect analysis hides heterogeneity in the relationship between institutional gap and trade flow. This heterogeneity depends on the covariates and varies based on values assumed by the covariates. While the average effect is informative, a clearer picture of the nuances in the relationship can be uncovered by exploring heterogeneous effects. Based on this we specify a non-linear gravity model for the relationship between institutional gap and trade-outflow.

$$\ln EXP_{ijt} = \alpha_i + \beta_j + \gamma_t + \theta_1 lnY_{it} + \theta_2 lnY_{jt} + \theta_3 Inst_{ijt} + \theta_5 Dist_{ij} + \theta_i Z_{it} + \theta_{i+1} Z_{jt} +$$

$$\theta_6 Inst_{ijt} * lnY_{it} + \theta_7 Inst_{ijt} * lnY_{jt} + \theta_8 Inst_{ijt} * Dist_{ij} + \theta_{i+2} Inst_{ijt} * Z_{it} + \theta_{i+3} Inst_{ijt} * Z_{jt} + u_{ijt}\ldots\ldots(3)$$

Following Chernozhukov et al. (2018) the model above can be used to report the sorted partial effects. Specifically, average partial effects average the effect for observations over the distribution of covariates, the sorted partial effect reports the distribution of partial effects sorted in increasing order (and indexed by the distribution of covariates). This reveals the heterogeneity in the effect.

For example, the relationship between institutional gap and trade flow may depend on exchange rate. Countries with stronger currencies can therefore be more likely to be net exporters and the relationship between trade inflows and institutional gap for these countries may not follow the hypothesized relationship. The sorted effect methodology maps the full distribution of effects and allows for classification analysis. This analysis classifies observation units into most or least affected based on the partial effects. Classification analysis is performed in two steps (after obtaining the sorted effects) (i) identify the observational units with partial effects above or below some thresholds to define the most or least affected groups (ii) report mean difference of covariates between the two groups.

Results & Discussion

The first analysis looks at a baseline model exploring how domestic institutions feature in the level of trade outflows between ECOWAs members. The results in Table 1 (column 1) shows a negative relationship between better domestic institutions and exports, while recipient country institutions, although positive, do not seem to matter much. The negative coefficient on the exporting country institutions is not in line with expectations, since good institutions are expected to promote productive activities, and hence lead to increases in exports. We check the robustness of the result using a method introduced by Oster (2019). This approach allows for the calculation of the degree of selection on unobservables needed to explain away the result (this parameter is named delta see Oster (2019)). Using this approach, we obtain a delta estimate of -0.04. The absolute value of the delta estimate suggests that very small selection on unobservables can have a substantial effect of the estimate. This implies that the fixed effects estimates may suffer from bias.

This bias is not surprising, given the expansive literature on the endogeneity of institutions (Acemoglu et al., 2001; Aghion et al., 2004). An approach often used to address this is the use of instrumental variables, proxied for by settler mortality. The idea being that, countries with high levels of settler mortality often have weaker foundational institutions established, which, with path dependence, often leads to relatively weaker institutions. We explore this approach, by instrumenting for exporting country institutions using settler mortality. The results are presented in columns 2 and 3 of table 1. First the last 4 rows show outcomes of the tests of validity of our suspicion, and the validity of our instrument. The underidentification tests show that the instrument is relevant, and the weak identification test suggests that the instrument is not weak. Furthermore, the instrument shows significant correlation with the endogenous variable (beta estimate of -0.59). Lastly, the endogeneity test is significant supporting the choice of the IV approach. The IV result show the expected positive relationship between exporting country institutions and trade outflow. While this is great and helps us to make the inference that institutions are indeed important for bilateral trade in general, and specifically, important for exporting countries to export to other countries within ECOWAS, a key component is lost in the process. The Settler mortality measure only captures static effect of institutions, the dynamics of institutional change, and its effect on trade is not well captures in the results in Table 2. This is likely why the R-squared is so small (-0.06). This is where our institutional gap measure comes to play.

Table 1: Export polity and trade outflow (fixed effects and IV regression)

VARIABLES	(1) FE	(2) First Stage	(3) Second
Ex Institutions	-0.04***		0.51***
	(0.01)		(0.10)
Im Institutions	0.01	-0.12***	0.05***
	(0.01)	(0.01)	(0.02)
Ex GDP	1.80***	0.06	2.35***
	(0.14)	(0.11)	(0.09)
Im GDP	1.03***	0.08	0.82***
	(0.14)	(0.10)	(0.08)
Ex Population	4.45***	0.20	-1.76***
	(0.39)	(0.16)	(0.12)
Im Population	2.07***	-0.08	-0.27***
	(0.38)	(0.12)	(0.10)
Im Exchange rate	0.07***	-0.01	-0.05***
	(0.02)	(0.02)	(0.01)
Ex Exchange rate	0.19***	-0.15***	0.16***
	(0.02)	(0.02)	(0.02)
Contiguity		0.12	1.39***
		(0.13)	(0.11)
Distance		0.00***	-0.00***
		(0.00)	(0.00)
Common language		-0.32***	1.71***
		(0.11)	(0.09)
Ex Settler Mortality		-0.59***	
		(0.08)	
Constant	-148.65***		
	(9.99)		
Observations	5,507	5,386	5,386
R-squared	0.43	0.05	-0.06
Number of country pair	174		
Underidentification test (LM statistic)			67.44
Chi-square p-val			0.00
Weak identification test (Wald F statistic)			58.89
Stock-Yogo weak ID test critical values			16.38
Endogeneity test			73.56
Endogeneity p-value			0.00

Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

If we consider the graphical depiction of the gap in institutional quality when aggregated across all ECOWAS countries will be misleading, as this aggregates to almost zero, in a zero-sum type of outcome. However, when we look at individual country pairs, the gaps become more evident. For example, in the graphs in Figure 7, looking at two member states, guinea Bissau and Nigeria, the gap in quality of institutions is plotted, against the trade outflows from both countries. The gap ranges from a little below zero (-1) in the late 1970s to a high of about 7 in the early 1990s, while in Nigeria, the gap ranges from about -1 in 1971, to a high of about 10 in the mid-90s. Moreso, for both countries, gap drops down to almost 1 in 2019. If we look at the average institutional gap across all member states, however, the gap is almost inexistent. Therefore, the unbundling of the gap in quality of institutions

between trading member states, is much more nuanced when assessing country pairs. This makes it a necessary addition to understanding the dynamics of integration and trade between ECOWAS member states, and within any type of regional integration arrangements in general.

Figure 7: Institutional gap and trade outflows for Guinea Bissau and Nigeria
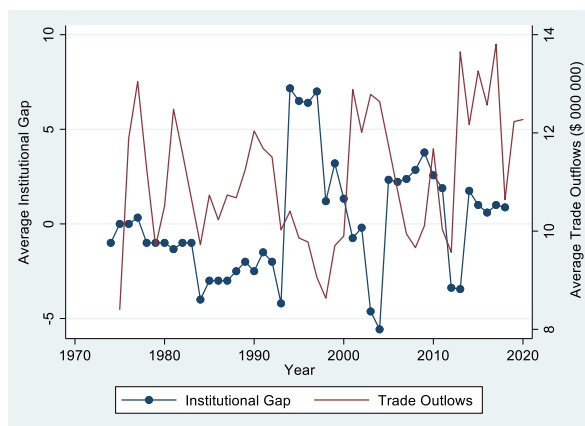
Guinea Bissau   Nigeria
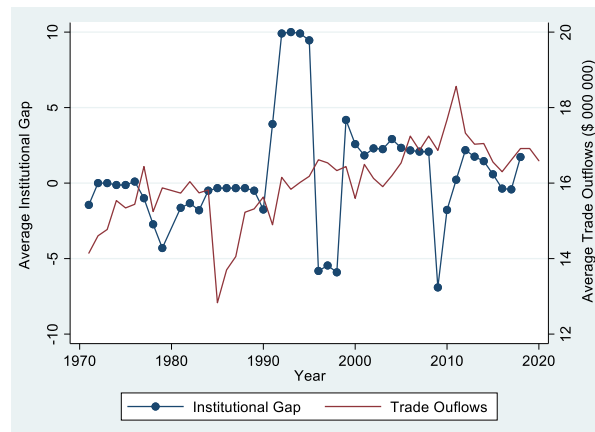
Source: Authors computations

The institutional gap measure, as previously argued is not expected to suffer from the endogeneity concerns that regular exporting country institutional measures suffer from. This is because it is a function of institutional measures in two countries. In addition, it allows for the variation in institutions across countries and across time to feature in how its impact is assessed. And lastly, it also fits in well within the gravity model framework, as it provides a singular measure between country pairs, which in a way, fully maximizes the potential of a gravity model. In other words, much like distance, language, or contiguity, "institutional gap" or "*institutional distance*" here can be considered a gravity variable. Table 2 (column 1) presents the result of the fixed effects regression. Consistent with our hypothesis, it shows a negative relationship between institutional gap and trade outflows. This suggests that as countries adopt similar institutional paradigms, the level of trade between countries tend to go up. This goes beyond the singular point effect espoused by using settler mortality as an instrument, rather, the integration of countries within ECOWAS is being considered here. It highlights that, while there is ongoing pursuit of higher levels of integration across regional cohorts in SSA, these efforts should take into consideration, first, the state of the quality of institutions at a country-specific level. In addition, how different the institutional environment are across these countries within any regional integration or economic community, may be quite important for how successful any efforts to promote intra-sub-regional trade will be.

To examine the influence of gravity variables we run OLS estimation with both country pair and year dummies, since this is technically equivalent to the fixed effects model. The results presented in Table 3 show that the role of institutional gap remains consistent with previous observations, as it negatively related to exports. However, the coefficients on the gravity variables present an interesting observation. For example, contiguity in the results in column (1) is positively correlated with exports, however, once Nigeria is excluded, both the contiguity and distance coefficients become negative and significant. This affirms our decision to check the model with and without Nigeria. It also speaks to sensitivity of the results. Meanwhile, the model is overall a better fit with the OLS that incorporates the gravity

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dynamics, than the fixed effects estimation that drops them. Lastly we check the robustness of the results in table 3 to possible bias due to unobserved factors (Oster, 2019). Estimate of delta is 5.45 and 3.79 for columns 1 and 2 respectively. The implication is that it is unlikely that the results can be explained away by unobserved attributes, since delta is greater than 1 (Buggle and Nafziger, 2021). This supports the claim that institutional gap is exogenous in the reported analysis.

Table 2: Fixed Effects Regression (with and without Nigeria)

VARIABLES	(1) FE	(2) FE without NGA
Institutional Gap	-0.02***	-0.03***
	(0.01)	(0.01)
Ex GDP	1.76***	2.24***
	(0.14)	(0.16)
Im GDP	0.99***	1.36***
	(0.14)	(0.15)
Ex Population	4.47***	5.08***
	(0.39)	(0.42)
Im Population	2.08***	2.06***
	(0.38)	(0.40)
Im Exchange rate	0.06***	0.07***
	(0.02)	(0.02)
Ex Exchange rate	0.18***	0.24***
	(0.02)	(0.02)
Year dummies	Yes	yes
Constant	-147.19***	-171.43***
	(9.98)	(10.62)
Observations	5,507	4,509
R-squared	0.43	0.45
Number of country pair	174	148

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Although the gap in institutions is a significant determinant for exports, it is not the most important. In fact, it has the smallest coefficient among all the covariates. Population seems to be the biggest determinant, followed by GDP. This suggests that larger countries in the region may be driving this result. This is especially important, when you have a regional player like Nigeria as a member of the ECOWAS. We test to ensure this is not the case. This is done by excluding Nigeria from the analysis. The results presented in column (2) of Table 2 remain consistent. If anything, the coefficients in Institutional gap, GDP and population are all larger in the second column. However, the fact that covariates like exchange rate, have large and significant coefficients, suggests that concepts like common currency, and by induction, some of the other gravity variables may be a significant factor. The fixed effects estimation as expected drop most of the gravity variables, because they are time invariant.

The results in Table 3 show that using the dummies is equivalent to the fixed effect results in table 1, but in addition, it provides estimate for the gravity variables. Therefore, this model is used for the sorted effects analysis that follow (see equation 3 for the specification of the sorted effect model). Exploring heterogeneity in the effect is important because the average effect might obscure heterogeneity in the partial effects and therefore present an incomplete picture of the effect of covariates. Moreso, the

qualitative nature of institutions requires such nuance, in order for concrete inference to made from the analysis. For example, the contiguity coefficient in table 3 (column 1) shows that sharing a boarder increases exports, but this might differ significantly across countries.

Table 3: OLS with Country pair and Year dummies

VARIABLES	(1) OLS	(2) OLS without NGA
Institutional Gap	-0.02***	-0.03***
	(0.01)	(0.01)
Ex GDP	1.76***	2.24***
	(0.14)	(0.16)
Im GDP	0.99***	1.36***
	(0.14)	(0.15)
Ex Population	4.47***	5.08***
	(0.39)	(0.42)
Im Population	2.08***	2.06***
	(0.38)	(0.40)
Im Exchange rate	0.06***	0.07***
	(0.02)	(0.02)
Ex Exchange rate	0.18***	0.24***
	(0.02)	(0.02)
Contiguity	4.22***	-5.03***
	(1.53)	(0.38)
Distance	0.00***	-0.00***
	(0.00)	(0.00)
Common Language	-2.84***	0.50
	(1.08)	(0.49)
Year dummies	yes	yes
Country pair dummies	yes	yes
Constant	-149.97***	-165.29***
	(10.71)	(10.26)
Observations	5,507	4,509
R-squared	0.74	0.75

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Figure 8 shows the heterogeneous effect as represented by the sorted partial effects (SPE, blue line). Even though (consistent with our previous results) the average partial effect (APE) is negative and statistically significant (black line). Figure 2 shows that there is considerable heterogeneity with the range of partial effect estimates including positive values specifically (-0.4, 0.4). The implication is that there is considerable heterogeneity in the relationship between trade inflows and institutional gap with some effects being positive and statistically different from the average effect (contrary to expectation). To get a sense of the variables that drive the heterogeneity, Table 4 presents the classification analysis. This analysis compares the mean of characteristics for the bottom 10% of the SPE distribution (those with negative relationship between institutional gap and trade inflows) with those in the top 10% of the SPE distribution. Variables which are important in explaining effect heterogeneity includes distance, population (both in the importing and exporting countries) and exchange rate (both in the importing and exporting country). Columns 1 & 2 show the mean of characteristics and standard error for countries in the top 10% of the SPE distribution, Columns 3 & 4 show similar result for countries in the bottom 10 %. Column 5 shows the difference in means between the top 10% and bottom 10%, while column 6

shows the p-value of the difference in means test.

Figure 8: Sorted heterogenous effects (APE & SPE) of Intuitional gap on trade outflow.

Percentile index, OLS model
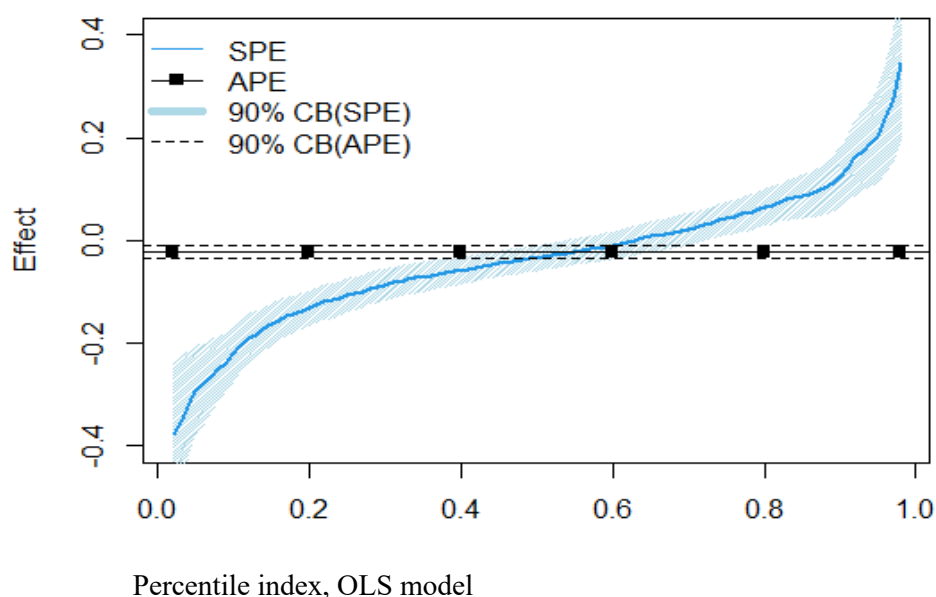
The results suggests that in the context of ECOWAS, when trading with a country that is further away, the relationship between trade inflows and institutional gap is more likely to be positive rather than negative. Higher population in exporting country also makes the hypothesised negative relationship less likely while higher population in importing country has the opposite effect. Weaker currency (in importing and exporting country) makes the hypothesised negative relationship more likely. That is, the role of exchange rate, and potentially a common currency may be an important factor for how institutional gap impacts on trade. This is an important result for integration efforts, especially with regards to monetary integration in ECOWAS.

Table 4: Classification analysis comparing top 10 vs bottom 10% of the Sorted Partial Effect distribution

	Most	SE	Least	SE	Estimate	SE	PW P-vals
Contiguity	0.26	0.03	0.32	0.03	-0.06	0.04	0.11
Common Language	0.49	0.03	0.48	0.03	0.00	0.05	0.48
Distance	1360.02	42.95	1133.01	49.99	227.01	72.74	0.00
Exp. GDP	22.68	0.11	22.48	0.10	0.20	0.16	0.11
Imp. GDP	22.73	0.09	22.84	0.10	-0.11	0.15	0.23
Imp. Population	15.88	0.08	16.07	0.09	-0.19	0.13	0.08
Exp. Population	15.99	0.09	15.79	0.08	0.20	0.13	0.07
Exp. Exchange rate	4.29	0.20	5.63	0.20	-1.34	0.32	0.00
Imp. Exchange rate	4.38	0.24	4.87	0.17	-0.49	0.33	0.07

As a final robustness check, we consider alternative measures of institutions, that may be closer related to shared ideals in the institutional environment in countries. Specifically, we look at executive constraints and political competition as alternatives to measures proxied by polity, as well as two sub-measures of the overall polity: autocracy and democracy. The results are presented in table A1 in the appendix, and remain consistent, in that the gap in the quality of institutions, or specifically, how

different countries are incorporating executive constraints into the law, and how different they are in terms of political competition, matters for how much trade occurs between them. All the coefficients are very small, and only democracy and executive constraints are significant. In all the cases, the relationship with trade, is a negative one, that is, as the difference goes up, exports to other ECOWAS countries reduces.

5. Conclusion

In this paper, we the explore the impact of institutions on intra-sub-regional trade. Using ECOWAS as our case study, we first explore domestic institutions, then follow this up, by harnessing the power of the gravity model, and exploring how differences in the quality of institutions (institutional gap), much like other gravity variables, such as distance or contiguity, relate to intra-sub-regional trade. Following some of the work by Akpalu (2018), which point out the role of institutions in determining trade outcomes, and Levchenko (2007), which speaks to institutional comparative advantages, and the welfare implications thereof. The results suggest that as countries become farther removed from each other, in terms of their political institutions, they tend to trade less.

Making use of panel ECOWAS countries, we utilize the gravity model, where the unit of analysis was country pairs rather than individual countries, to tease out the role of institutions in determining the effectiveness of regional integration efforts. With the ongoing efforts to increase intra-regional trade, as the implementation of the African continental free trade agreement (AfCFTA) edges closer, there is a need to understand the mechanisms that may pose a hindrance or help accentuate the desired outcomes. Given that many regional agreements with intents to increase the level of integration overtime, already exist, any effort with a goal of achieving increased intra-sub-regional as well as intra-Africa trade would do well to have a nuanced understanding of the role of the institutional environments in helping or curtailing those efforts.

Our analysis showed that, almost in agreement with Levchenko (2007), differences in the quality of institutions do provide some sort of institutional comparative advantages to trade, and may potentially increase the gains from trade. The use of the gap in quality of institutions between trading partners is an innovative way to circumvent the issues that arise with endogenous institutions, while harnessing the power of the gravity model. While the gap in the quality of institutions is not as important as some of the gravity factors such as common language and contiguity, it is surprisingly more important than distance. The results remain consistent despite a number of robustness checks, which includes accounting for a major regional player like Nigeria, ensuring gravity variables are not excluded as non-varying observation in a fixed effects estimation, and alternative measures of the quality of institutions.

Our result also shows that the relationship between institutional gap and trade is heterogeneous. We find that gravity variables by-and-large explain the heterogeneous relationship. This shows that in the context of ECOWAS, while the hypothesis of a negative relationship between institutional gap and trade flow is consistent with the data on average, there are relationships with coefficients not conforming to expectation. First the SPE (figure 2) shows that the relationship is positive and significantly different from the average partial effect for about 40% of the observations. In other words, for these observations larger institutional gap is correlated with trade. We also find that gravity variables interact with institutional gap to produce heterogeneous effects, some of which are counterintuitive. For example, the interaction between institutional gap and distance make a positive (rather than) negative relationship between the variables of interest more likely. On the other hand, population in both the

importing and exporting countries have the opposite effect. This highlight that the average partial effect obscures the heterogeneous effect.

The next step in understanding the role of institutions in determining intra-sub-regional trade, would be to trace out sectoral and firm dynamics of this institutional difference, first within the ECOWAS region, and further in other already existing regional integration agreements such as in Southern and Eastern Africa. This would help inform the nature of agreements and desired level of integration that should be targeted. This is especially important, given the ongoing AfCFTA integration efforts.

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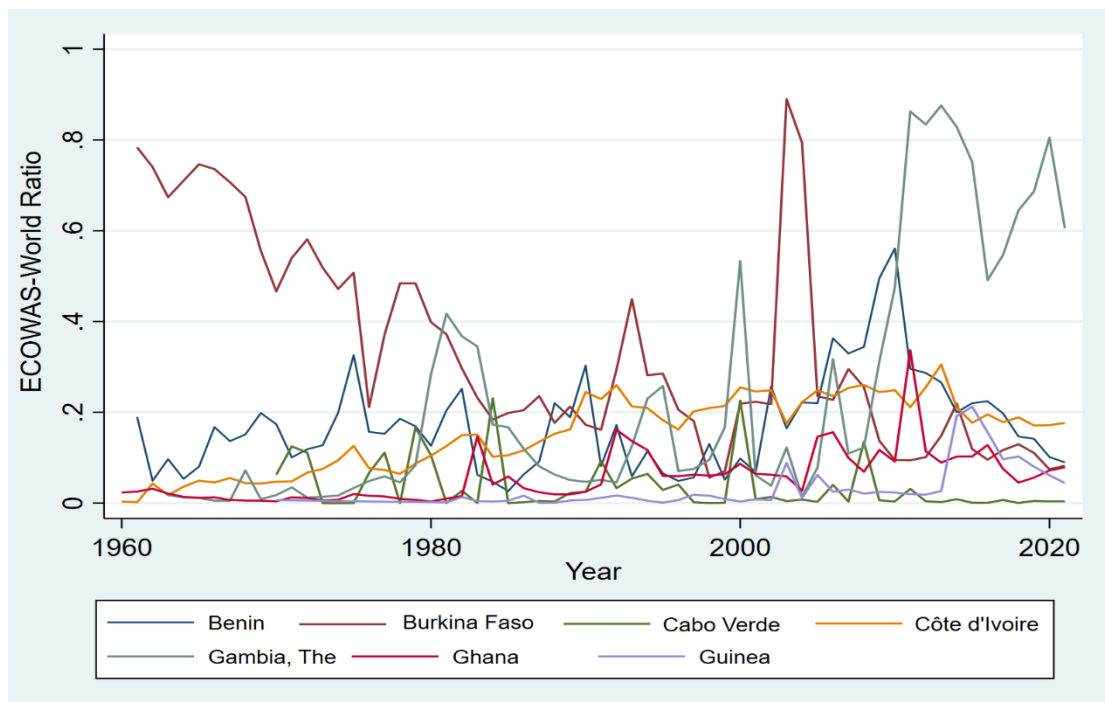
Management, 4(5), pp.678-686

Appendix

Figure A1: Exports within ECOWAS compared to other regional groupings.
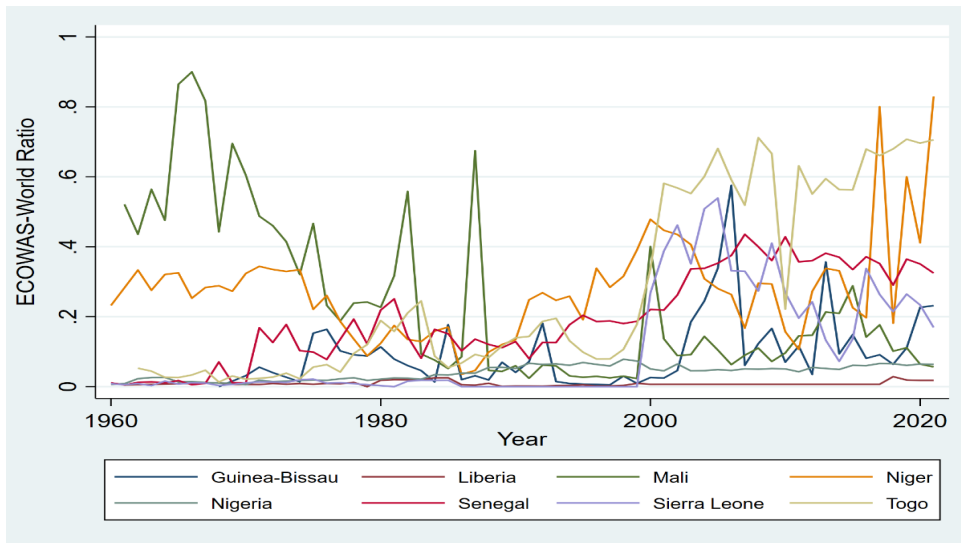

(a.) World
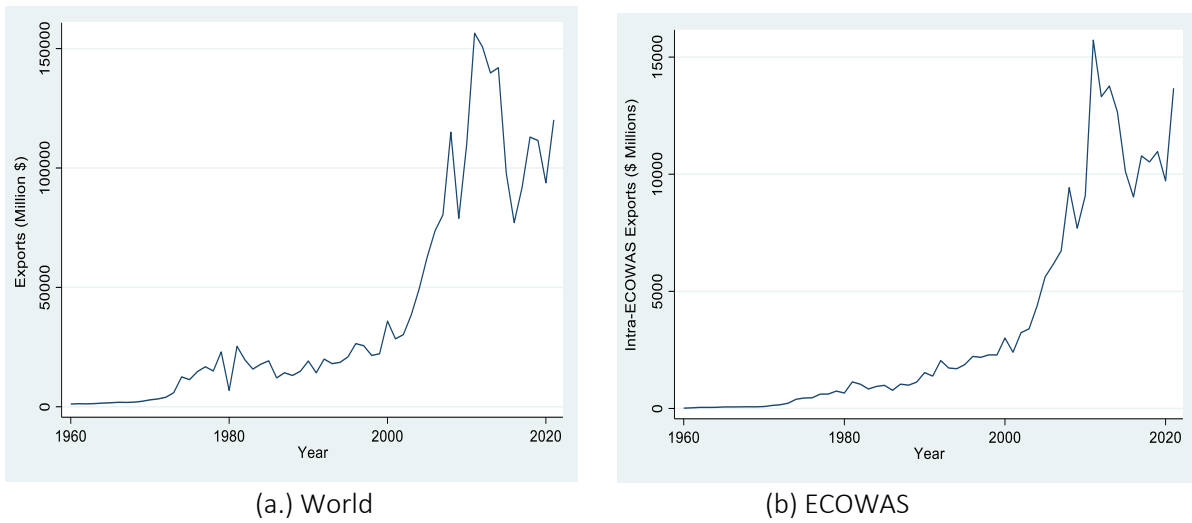
(b) ECOWAS

Source: Authors calculations (IMF DOTS)

Figure A2: Intra-ECOWAS exports (1960 – 2020)

Source: Authors calculations (IMF DOTS)

Figure A3: Intra-ECOWAS exports (1960 – 2020)

Source: Authors calculations (IMF DOTS)

Table A1: Robustness Analysis

VARIABLES	(1)	(2)	(3)	(4)
Democracy gap	-0.00**			
	(0.00)			
Executive constraint gap		-0.00*		
		(0.00)		
Autocracy gap			-0.00	
			(0.00)	
Political competition gap				-0.00
				(0.00)
Ex GDP	1.71***	1.71***	1.70***	1.71***
	(0.14)	(0.14)	(0.14)	(0.14)
Im GDP	1.02***	1.02***	1.04***	1.04***
	(0.14)	(0.14)	(0.14)	(0.14)
Ex Population	4.47***	4.47***	4.48***	4.47***
	(0.39)	(0.39)	(0.40)	(0.40)
Im Population	2.12***	2.11***	2.11***	2.12***
	(0.38)	(0.38)	(0.38)	(0.38)
Im Exchange rate	0.07***	0.07***	0.07***	0.07***
	(0.02)	(0.02)	(0.02)	(0.02)
Ex Exchange rate	0.18***	0.18***	0.18***	0.18***
	(0.02)	(0.02)	(0.02)	(0.02)
Constant	-147.26***	-147.30***	-147.45***	-147.66***
	(10.00)	(10.00)	(10.01)	(10.01)
Observations	5,507	5,507	5,495	5,499
R-squared	0.43	0.43	0.43	0.43
Number of country pair	174	174	174	174

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1