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Colonial Traces of Fractionalization: The Possibilities of Africa Moving Beyond the Walls to a Sustained Growth

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Colonial Traces of Fractionalization: The Possibilities of Africa Moving Beyond the Walls to a Sustained Growth

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I. Introduction

Though many factors have been found to account for the underdevelopment of African countries, fractionalization has been gaining increasing attention in the development literature. For example, many researchers have explored the relationship between institutions, ethno-linguistic fractionalization and growth. This includes the indirect effects of colonial institutions on the ability of Africans to trade peacefully. Colonial institutions in Africa are found to have exacerbated fractionalization, which led to the poor growth of African countries. Alternatively, others find that good institutions mitigate fractionalization and this leads to economic growth. Some other findings are that ethno-linguistic fractionalization negatively impacts economic growth and policies in Africa, and this is responsible for poor growth in Africa (Leeson, 2005; Easterly, 2001; Easterly and Levine, 1997).

The relationship between linguistic diversity, political stability and democracy has also been investigated widely and researchers find that linguistic diversity has positive impact on political instability. It is also discovered that democracy eliminates the negative impact of ethno- linguistic fractionalization on growth. There is also an established positive relationship between ethnic homogeneity and trust, which reinforces the positive relationship between trust and economic growth (Collier, 1999; Knack and Keefer, 1997). Cunning and Fay (1993) also explore the relationship between long-run growth and ethno-linguistic fractionalization.

There is also a plethora of literature on the relationship between colonization and growth. European colonization, for example, has a negative impact on growth. Colonial heritage, measured as the identity of the Metropolitan ruler and the degree of Economic Penetration (GNP/GDP), is one of the reasons for low average growth rate of GDP per capita and the observed heterogeneities in Africa. This explains differrences in investment output ratio, education attainment and the index of ethno-linguistic fractionalization. Other researchers have also established a negative relationship between the number of years of colonial rule and growth. Also, by exploring the effect of ethnic, linguistic and religious fractionalization on the quality of growth, other studies find that linguistic and ethnic (racial) fractionalization are strongly negatively related to growth, but religious fractionalization is not (Bertocchi and Canova, 2002; Grier, 1999; Alesina, Devleeschauwer, Kurlat, Easterly and Wacziarg, 2003). Some other works in the area of economics of language include the explanation of the evolution of languages, the investigation of the economic and demographic determinants of destination language proficiency among immigrants and the connection between trade and languages. These researchers show that trade requires language. (Rubinstein, 1998; Chiswick, 2008; Smith, 1776).

Most of these researches focus on fractionalization as an exogenous variable. In this paper, I empirically investigate the determinants of fractionalization and argue that it can be reduced. For example, while the main focus of Easterly and Levine (1997) and Leeson (2005) is that regardless of heterogeneity countries can realize gains from trade, this paper asserts that trade can reduce fractionalization society. In other words, if and as diverse individuals trade, the walls of linguistic fractionalization and ethno-linguistic fractionalization can eventually be lowered significantly if not utterly destroyed as a result of their interaction. The paper posits that if incidents and events such as colonial policies that sever the interaction of diverse individuals had not occurred, trade among African countries would have developed at a faster pace. This

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increased trade would then lead to declining fractionalization, paving the way for a faster growth in Africa.

Thus, though many papers have investigated fractionalization and its effects on growth and development few, if any, researchers have empirically endogenized fractionalization specifically in an African context. This paper fills the gap by providing an empirical analysis of linguistic using OLS, Seemingly Unrelated Regression (SUR) and Spatial Autoregressive model (SAR). The results suggest that, among other factors, the measures of colonization (the number of years of colonial rule, colonial history and colonial heritage) do affect the persistence of fractionalization in Africa. The paper also finds that linguistic fractionalization is spatially dependent (contagious) suggesting that the best ways to address fractionalization include steps that will reduce linguistic fractionalization.

The rest of this paper is organized as follows: in the following section the study examines the possibility of linguistic fractionalization decline in Africa, followed by what exactly transpired during colonial rule. It then continues with specification of the methodology, presentation of my results, robustness checks, and discussion of the possibility of linguistic fractionalization decline in Africa today.

II. The Possibility of Fractionalization Decline in Pre-Colonial Africa

a) *Pre-colonial Africa and the Decline of Fractionalization*

African countries are among the world's most ethnically diverse countries. According to Easterly and Levine (2001), African countries are among fourteen of the world's fifteen most ethnically heterogeneous societies, with Uganda being the world's number one. Other societies in the world have gone through a phase of fractionalization comparable to Africa but, unlike the rest of the world, fractionalization in Africa seems to have come to stay.

However, before colonization, though fractionalized, Africa was one big society with no official significant differences. In order to commute from one area to the other, people did not need any documents or permission as long as they had the means of transportation and travelled through other settlements peacefully. Though sometimes special gifts and offerings were given to the chiefs and fetish priests of other societies through which one travelled or undertook business transactions, movement as well as assimilation into other societies and cultures was very common. Outsiders wanting to join a particular community gave special gifts to the Earth's Priests and agreed to respect the community's rituals (as a signal of credibility) and, thus, were given the possibility of trading with the existing group members. (Leeson, 2005).

This is accentuated by the fact that some languages and cultures are common to a lot of ethnic groups across African countries today. For example, there are tribes in many African countries who speak same languages as some tribes in other African countries today. In other words, this shows that interaction of different societies through trade (free trade) was highly possible even in the face of fractionalization. Domestic, long distance and international trade developed in Africa with the resultant social interaction between different ethnic groups prior to European's arrival on the continent (Cohen, 1969: 6). There were also commercial interactions in pre-colonial Africa to the extent of creating homogeneity between different diverse people (Thornton, 1995: 194). Thus, without any interruption, there was the possibility that the walls of fractionalization might be lowered to their minimal levels if not utterly destroyed.

One way ethno-linguistic fractionalization could have declined in the absence of colonial rule is that, with time, some languages and cultures could become dominant over others in each society or a lingua franca could have evolved. In every society, each group is identified with a certain kind of occupation. Typical examples are farmers, (including shepherds who travel widely in search of pasture), and traders. The latter are very influential as they move from one place to the other and must interact with the indigenous people in order to transact business with them. Consequently, they tend to spread their language and culture from place to place. For example, commercial interactions help explain the great cultural similarities between many different peoples south of the equatorial forest (Vansina, 1968: 325). It is imperative to point out that most countries that have adopted one language today have gone through an evolution. This process of evolution from linguistic fractionalization as evident in other countries' experiences could have taken place in Africa too, but this was interrupted or slowed down, largely, as a result of colonization.

b) *Cost and Benefits of Learning a New Language in Pre-colonial Africa*

Language skill is human capital, since it satisfies the three requirements of a human capital namely productivity, costliness and embodiment in a person (Chiswick, 2008). The first two of these attributes imply that there is a benefit and cost associated with learning, adopting or developing a language that will serve the common good of a fractionalized society as Africa. If the cost is higher than the benefit, then the society or individuals who make up the society will stick to their different languages, instead.

One of the costs of learning a dominant language or developing a common language in pre-colonial Africa is time; it takes time for one to learn a new language, especially so for the old. It could also take

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time for parents and relatives to teach the young this new language, but in pre-colonial Africa where interacttion among diverse individuals was free the process could be much faster than it was under colonial rule. Exposure to the dominant language is another determinant of the cost of learning a new language. This exposure was much greater in the absence of colonial barriers and colonial immigration restriction policies. Similarly social distance, another cost of learning a new language, was smaller in pre-colonial Africa. For example, Leeson (2005) argues that pre-colonial agents used signals such as property usage, religious practices and the individual's relationship to authority to minimize the social distance between sender and receiver to send their credibility to outsiders they wanted to trade with.

Another factor that determines the cost of learning a new language is distance between one's mother language and the new (dominant) language. Though Africa has many languages, one thing these languages mostly have in common is their syllabus. You can almost write every language using a set of alphabets. There are many languages that have certain words in common as well. This means that it will be easy for a speaker of one African language to learn to speak another or most African languages.

There are also benefits associated with learning a new language. One of such benefits is productivity; language is productive in consumption activities. This implies that it will enable people find quality goods and services at lower prices. Trading in Africa, including today's, requires one's ability to negotiate prices, so the more proficient you are in a trade language the higher your chances of success. Not only would learning a dominant language in pre-colonial Africa enable people do well in the market, it would also make them find good jobs in the labor market. Learning a new language enables agents to execute their jobs efficiently. Other social benefits include one's ability to network and make a wide range of friends outside his linguistic enclave and the enhancement of civic involvement by gaining full political and economic rights of the new (dominant) spoken language community (Chiswick, 2008). In pre-colonial Africa, learning the larger society's language could be seen as a signal of credibility and could result in gaining access to full benefits of the larger society.

III. The Worsening of Fractionalization During Colonial Rule

Colonial rule seems to play a role that stymie the decline of linguistic fractionalization in Africa. Leeson (2005) explores the indirect effects of colonial institutions on the ability of Africans to trade peacefully. One of the findings includes how artificial colonial institutions such as forced allegiance to an authority disabled the signal that individuals look to when evaluating the credibility of outsiders to trade with, which resulted in the creation of smaller sub-groups among broader ones to eliminate the risk of interacting with those who were remotely unknown. Thus, this colonial distortion of trade further reduced social and commercial interaction that would expose individuals to and cause them to learn a dominant (trade) language.

Second, colonial rule inhibited free movement of individuals in Africa and this was no environment for cultural or linguistic convergence. As opposed to pre-colonial Africa where people could come and go as they pleased, so that it was possible for people to be members of multiple communities and hence exchange with a wide range of individuals, colonial land policy created noise in this signal used to convey credibility by legally requiring colonial agents to stay attached to their ruler-allocated areas of land. Such a colonial policy also restricted migration, as was the case of Basutoland in 1903 when colonial law forbade the provision of land to non- Basotho people (Leeson, 2005). Limited mobility under colonial rule was therefore one of the factors that reduced the need to adopt or learn the most widely spoken language(s) as the cost of doing so became more than the benefit, if any.

Another way colonization exacerbated linguistic fractionalization in Africa is that colonial masters separated African countries into territories that may never be reconciled to each other. The separation has far reaching ramifications of maintaining ethno-linguistic borders especially across countries. As mentioned above, walls of colonization have divided different African societies that had common languages and cultures. Societies that once saw each other as one though far apart, because of language and culture, now see each other as aliens. Even if the walls of ethno-linguistic fractionalization gradually break down in each colony (now country) it may never break down across countries, unless stringent measures are taken. This is because these colonies now see one another as different entities. For example, the people from the Volta region of Ghana speak the same language and have same culture as about half the population of Togo, a neighboring country, but are now considered aliens in Togo because of colonial walls. The same is true for tribes of many neighboring countries in Africa.

Moreover, colonization led to the proliferation of different institutions in Africa that made it difficult to reduce fractionalization. Colonial created institutions severed the communication mechanism between sociallly heterogeneous individuals in Africa by reducing the signals (pre-colonial institutions) that enabled communication and interaction as this increased the cost of commercial interaction. Legal systems of each colonial master were different and this made it difficult for Africa to adopt an institutional framework that supported continent-wide development initiatives such as free trade areas. These legal frameworks that

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distorted the already established ones before them helped prolong fractionalization in Africa. In addition, the division of colonies into regions and districts by some colonial rulers has huge ramifications. This was an attempt to facilitate colonial rule but now permanently left these internal groups at conflict with each other over lands, resources and domains. Colonial policy led to a break-down of the ability of African people to interact freely and, instead, led to a sharp increase in property disputes among Africans (Leeson, 2005).

One would think that the introduction of the language of the colonist should mitigate linguistic fractionalization but what happened was the exact opposite. Unlike societies such as Latin America where colonial masters introduce Spanish to the whole society, the colonial master's language was intended for only a few selected Africans, who helped in the facilitation of communication of the colonial masters with the rest of the African societies. If a larger population of each country were taught the colonial master's language, it could help promote homogeneity. Today, the colonial master's language is a luxurious commodity in Africa, and it is largely the rich consume it. In most cases, one could only learn this language (official language) through formal education, which is costly. Studies show that 90 percent of the population in most African countries does not speak the official language at home (Easterly and Levine, 1997). In other words, these official languages tend to add to linguistic diversity in Africa rather than help create homogeneity.

Coupled with above, the same master did not colonize all African countries, and that means ranging from English to Spanish, more languages were added to the several languages spoken in Africa rather than replace them (a situation that would have reduced fractionalization in Africa). If a greater proportion, if not all, of the population of Africa countries were able to speak its colonial master's language the outcome would have been close to desirable.

Post-colonial attempts to use the colonial master's language to reduce linguistic fractionalization in Africa did not succeed. Most African countries made it mandatory for every school going person to learn the official language (colonial master's language) of their neighboring African country. Due to these colonial walls that have now become official barriers, even if one learns the neighboring country's language he could do little with it (because hardly does anyone speak that language in the domestic country) and hence tend to forget it a few years after leaving school. If there were no official barriers and people could travel freely to neighboring countries to trade or undertake other commercial activities, continuous use of the neighbor's language could cause them to be proficient not only in their own official language, but also in the language of their neighboring countries. Canada is an example of the possibility of speaking a second official language in the absence of official barriers.

IV. Methodology

a) Data

This study estimates the impact of colonial rule (number of years of colonial rule) on fractionalization in Africa. The data comprises a cross-section of 49 African countries from 1980-2000. The list of countries is found in Appendix 2. Data on linguistic fractionalization is computed by Alesina, Devleeschauwer, Kurlat, Easterly and Wacziarg (2003). This variable is based on the shares of languages spoken as mother tongues. The reason for the choice of this variable is that it is entirely based on language and hence different from the effect of any racialor ethnic features.

Even though both linguistic fractionalization an ethnic fractionalization were used by Alesina, Devleeschauwer, Kurlat, Easterly and Wacziarg (2003), in most of their main regressions linguistic fractionalization does have a bigger effect (and higher level of significance) on growth than ethnic fractionalization. I thus employ only linguistic fractionalization in my regressions.

The population, GNP and GDP data are taken from the World Bank's databases. One of the measures of olonial rule, colonial penetration (also referred to as "drain") is the ratio of a country's GNP to GDP in 1960 as in Bertocchi and Canova (2002). The lower the value of GNP the higher the level of colonial penetration and the lower the ratio. They use this as a measure of colonial drain following the drain of wealth thesis. According to them this measure captures how Metropolitan countries further extracted colonial surplus by reducing indigenous capital accumulation through repatriation of profits, pensions, interest on loans and salaries. They argue that the impact of colonization may survive past political independence but those colonies kept paying the consequences of their history even after independence was achieved.

Institutional measures are taken from the International Country Risk Guide (ICRG). Data on colonial rule is taken from the World Fact Book. The length of colonization was compiled based on Barro (1991), which provides data including dates of independence. A detailed description of the data, together with summary measures is given in Appendix 1.

b) Model

Both OLS and a spatial econometric model, SAR (Spatial Autoregressive Model) are employed in the main regressions. A simultaneous equation model is also employed for robustness analysis. SAR specifies a country's linguistic fractionalization as a function of the weighted value of the linguistic fractionalization of its geographic neighbors. The models are specifiedbelow. OLS:

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$$Elf = \alpha 0 + \alpha 1 Colrule + \alpha 2\ Institutions + \alpha 3 Colpen + \alpha 4 GDP + \alpha 5 Poltstability + \alpha 6\ Borderdummy + \eta \quad (1)$$

$$Trade = \alpha 0 + \alpha 1 Colrule + \alpha 2\ Institutions + \alpha 3 Colpen + \alpha 4 GDP + \alpha 5 Poltstability + \alpha 6\ Borderdummy + \omega \quad (2)$$

where, *Elf* represents linguistic fractionalization, *Trade* is the volume of bilateral trade between each country and all other countries in the study, *Colrule* is the number of years a country has been colonized, *Institutions* is an index of the quality of a country's institutions, *Britishdummy*, *Frenchdummy*, and *Belgiumdummy* are colonial history dummies for African countries colonized by Britain, France and Belgium respectively *Borderdummy* is a dummy created for countries whose post colonial borders existed before colonial rule, and η and ω are NX1 matrixes of *iid* random errors.. Colonial rule is expected to have positive impact on linguistic fractionalization and negative impact on trade. Equation (2) is only employed for robustness analysis.

SAR:

$$Y = \alpha + \rho WY + \beta X + \nu \quad (3)$$

where X is a vector of controls variables specified above, Y is an NX1 vector of measures of the dependent variables; ρ is the spatial autoregressive and spatial error coefficients (which represents geographic contagion in the dependent variable), and ν is an NX1 matrix of *iid* random errors. W is an NXN weight matrix for geographic neighbors.

For the geographic weight matrix a country gives a weight of one to every country it shares a border with (whether vertically, horizontally or at vertex contacts) and zero otherwise. The geographic weight matrix is row standardized. For example, if country A has 4 neighbors, then each of these countries is assigned a weight of ¼ by country A.

$$W = \begin{bmatrix} \frac{\mu_{1j}}{\sum \mu_{1j}} & \cdots & \frac{\mu_{1n}}{\sum \mu_{1j}} \\ \vdots & \ddots & \vdots \\ \frac{\mu_{nj}}{\sum \mu_{nj}} & \cdots & \frac{\mu_{nn}}{\sum \mu_{nj}} \end{bmatrix} \quad \text{for } j = 1, 2, \ldots n$$

$$\text{Where, } \mu_{ij} = \begin{cases} 1 & \text{if county } i \text{ and } j \text{ are neighbours otherwise} \\ 0 \end{cases} \quad (4)$$

This makes the weights given by each country to all others sum up to 1. This is represented in matrix notations above.

V. Results

a) Main Findings

The results suggest that the number of years of colonial rule in an African country affects a country's level of linguistic fractionalization.

Table 1 results show that without controlling for institutions the number of years of colonial rule is positive but insignificant. However, once I control for institutions both the number of years of colonial rule and institutions become significant. Similarly, other measures of colonial rule are also positive and significant in Table 1. Colonial Penetration is positive and significant in all regression while French Colonial Dummy is also significant but only when institutions are controlled for.

Table 2 reports the results for the SAR model. The main aim of this regression is to find out if there is a spatial dependence in the dependent variables; that is if countries that have low levels of linguistic fractionalization tend to be neighbors and vice versa. The results indicate that linguistic fractionalization is contagious. This is evident, as the coefficient, (rho), is significant. A possible reason explanation is that languages can be created, adopted, spread or dominated.

Controlling for spatial dependence also makes all the independent variables, except British and French colonial dummies, insignificant. This can be explained by the fact that all the independent variables are spatially correlated. All of them are measures of colonial rule. Thus the geographic weight matrix therefore captures and removes this spatial correlation making these variables insignificant. British colonial dummy is now significant and French colonial dummy is still positive and significant, still indicating the effects of British and French colonization on linguistic fractionalization.

b) Robustness Checks: Adding New Variables and Comparing Alternative Models (SUR and OLS)

While the above gives an indication that the length of colonial rule and colonization in general does have an effect on the fractionalization measure, the paper attempts to check the robustness of the results by including other independent variables, and a dependent variable (trade), to see if the results will change signify-

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cantly. To do this, a simultaneous equation specification is also employed in addition to the OLS regression. The use of such a specification can improve standard errors as well. A seemingly unrelated regression (SUR) models are specified below based on equation (1) and (2) above:

SUR:

$$Elf = \alpha 0 + \alpha 1 Colrule + \alpha 2\ Institutions + \alpha 3 Colpen + \alpha 4 GDP + \alpha 5 Poltstability + \alpha 6\ Borderdummy + \eta \quad (1)$$

$$Trade = \alpha 0 + \alpha 1 Colrule + \alpha 2\ Institutions + \alpha 3 Colpen + \alpha 4 GDP + \alpha 5 Poltstability + \alpha 6\ Borderdummy + \omega \quad (2)$$

First, I estimate the impact of colonial rule on trade. Table 3 shows that there is a negative impact of colonial rule on bilateral trade between African countries (as seen in the OLS regression) and the results are significant at 5%-10% levels. However no other independent variable is significant in the OLS regression. Table 4 presents the results for SUR regression based on equation (1) and (2) above. The SUR result for linguistic fractionalization is still significant, but the trade result is no longer significant. In addition, the linguistic fractionalization regression gives a negative and significant coefficient of institutions. Thus there is a negative relationship between linguistic fractionalization and institutions. However, the results suggest that whereas colonial may have an effect on trade, institutions do not have an effect on trade.

VI. Is there a Possibility of Linguistic or Ethno-Linguistic Homogeneity in Post-Colonial Africa?

Though one cannot say for certain whether ethno-linguistic fractions can reduce enough in Africa, looking at what is going on other continents suggests that there is a possibility. Economic integration or political integration or both can help. For example, English is becoming a "lingua franca" in Europe following the reduction of legal barriers that now facilitates the movement of people and the removal of non-tariff and tariff barriers that facilitates trade (the free mobility of goods) across EU countries (Chiswick, 2008).

If this EU paragon could be applied in Africa, free trade and free mobility of economic agents could call for, if not result in, a lingua franca. This new language, which can be a widely spoken African language or one of the widely spoken languages introduced by colonial masters, would reduce linguistic fractionalization. When a big society speaks the same language, ethnic fractionalization will also dwindle, because it will become more and more difficult to tell ones ethnicity when everyone's name is in the same language. Governments can help fund the teaching of this language and make individuals view the speaking of such a language as a sign of demonstrating patriotism or nationalism. Creating the awareness of the effect of homogeneity on economic growth of Africa can help Africans embrace such policies. In other words there are benefits as well as costs associated with achieving linguistic and ethnolinguistic homogeneity now as, if not more than, it was in pre-colonial Africa.

VII. Conclusion

The findings of this paper show that while colonization worsened both linguistic fractionalization in Africa, its effect on effect is only significant by controlling for institutions. This is supported by the results of this paper, which show that the number of years a country was colonized, colonial penetration and colonial history do have a positive impact on linguistic fractionalization in Africa. It also shows that while both French colonial rule and British colonial rule exacerbated linguistic fractionalization, others did not. This may be due, for example, to colonial policies such as divide-and-rule practiced by Britain.

Also the results suggest that linguistic fractionalization is more adversely affected by colonialism than trade and that while colonial institutions have negative effect on linguistic fractionalization, it does not have any significant effect on trade. The results also support the view of Leeson (2005) that bad institutions worsen fractionalization and that this is one of the reasons for the increasing fractionalization and poor growth in Africa. Apart from the division of the continent into colonies, different foreign languages and institutions introduced by colonial rulers made it difficult for Africa to reduce its level of fractionalization. Therefore, policy recommendations for mitigating or eradicating the effects of linguistic fractionalization in Africa may include the introduction or emergence of a lingua franca.

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Table 1 : Dependent Variable: Linguistic Fractionalization

Independent Variables	I	II
Constant	2.910** * (3.65)	1.626** (2.23)
Colonial Rule (no. of year)	0.003** (2.14)	0.0002 (0.25)
Institutions	-0.202 *** (-2.63)	
Colonial Penetration	-0.025*** (-3.21)	-0.013* (-1.73)
British Colonial Dummy	0.642** (1.99)	0.306 (1.03)
French Colonial Dummy	0.554* (1.78)	0.336 (1.13)
Belgium Colonial Dummy	0.338 (0.79)	0.263 (0.73)
Border dummy	0.030 (0.20)	-0.063 (-0.40)
R-Squared	0.35	0.15

*Notes: t-statistics in parentheses; asterisks indicate significance as follows: ***=1%, **=5%, *=10%. Variable description, descriptive statistics, and sources can be found in Appendix 1.*

Table 2 : Dependent Variables: Linguistic Fractionalization

Independent Variables	I	II
Constant	0.246 (1.595)	0.246* (1.710)
Rho	0.317*** (2.49)	0.312*** (2.424)
Colonial Rule (no. of year)	0.0005 (1.065)	0.0004 (1.081)
Institutions	-0.002 (-0.039)	
Colonial Penetration	-0.0004 (-0.400)	-0.0004 (-0.399)
British Colonial Dummy	0.210* (1.62)	0.209* (1.671)
Belgium Colonial Dummy	-0.028 (-0.146)	-0.028 (-0.144)
Border Dummy	0.027 (0.270)	0.027 (0.270)
R-Squared	0.17	0.17
Observations	49	49

*Notes: t-statistics in parentheses; asterisks indicate significance as follows: ***=1%, **=5%, *=10%. Variable description, descriptive statistics, and sources can be found in Appendix 1*

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Table 3 : Dependent Variables: Trade

Independent Variables	I	II
Constant	23.861 (0.08)	98.928 (0.40)
Colonial Rule (no. of year)	-0.363* (-1.84)	-0.330** (-2.130)
Institutions	24.835 (0.59)	
Population	0.418 (0.65)	0.441* (0.69)
Political Stability	25.4031 (0.65)	22.753 (0.69)
Colonial Penetration		
GDP	0.00004 (0.30)	0.0001 (0.77)
Border Dummy	-48.513 (-0.747)	-48.513 (-0.747)
R-Squared	0.18	0.17
Observations	49	49

*Notes: t-statistics in parentheses; asterisks indicate significance as follows: ***=1%, **=5%, *=10%. Variable description, descriptive statistics, and sources can be found in Appendix 1.*

Table 4 : Dependent Variables: Linguistic Fractionalization & Trade

	Dependent Variables	
Independent Variables	Trade	Linguistic Fractionalization
Constant	165.912 (-0.37)	2.545** (2.41)
Colonial Rule (no. of year)	2.590 (1.34)	0.0051*** (3.21)
Institutions	-41.776 (-0.53)	-0.136** (-1.92)
Population	0.466 (1.23)	0.441 (1.41)
Political Stability	47.712 (0.79)	-0.0150 (-1.46)
Colonial Penetration		-0.0711 (-1.42)
GDP	-0.0004 (-1.02)	-0.00001** (-1.96)
Border Dummy	-15.432 (-0.12)	-0.009 (-0.09)
R-Squared	0.22	0.460
Observations	49	49

*Notes: t-statistics in parentheses; asterisks indicate significance as follows: ***=1%, **=5%, *=10%. Variable description, descriptive statistics, and sources can be found in Appendix 1.*

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Appendix 1 : Variable Description, Descriptive Statistics, and Sources

Variable Name (source)	Description	Mean (Std. Dev.)
Dependent Variables:		
Linguistic Fractionalization (3)	Index of linguistic diversity (%)	0.623(0.291)
Ethno-linguistic Fractionalization(6)	Index of ethnic and linguistic diversity (%)	0.616(0.26707)
Trade (2)	A country's total volume of trade with each African country (US$)	237.111(253.877)
Independent Variables:		
GDP (1)	GDP (constant 2001 US$)	9.43E+09(1.99E+10)
Colonial Penetration(1)	GNP/GDP computed for 1960: The lower the value the higher the extent of colonial penetration.	98.993(4.341) 2.327(0.993)
Institution (5)	Index of institutional quality computed as an average of three variables (bureaucratic quality, risk of expropriation, and the risk of repudiation of contracts): (1-10); the higher the better.	
Colonial Rule (4)	Number of years a country has been colonized by all possible colonial Masters (years)	106.065(120.9877)
Political stability (5)	Index of political stability (1-10).	6.997(1.115)
Border dummy	A dummy specifying whether a country's borders were created by colonial masters	
Colonial Dummy	A dummy showing which colonial master colonized a country	
Population (1)	Total population of a country (millions)	13604971(17391899)

1. World Development Indicator; The World Bank Databases. 2. Direction Of Trade; IMF Databases. 3. Alesina et al. (2003) Dataset. 4. CIA, The World Fact Book
5. International Country Risk Guide; ICRG Dataset 6. Elf Dataset

Appendix 2 : List of Countries

Algeria	Egypt	Morocco
Angola	Equatorial Guine	Mozambique
Benin	Ethiopia	Niger
Burkina Faso	Gabon	Nigeria
Burundi	Gambia, The	Rwanda
Cameroon	Ghana	Senegal
Cape Verde	Guinea	Sierra Leone
Central African	Guinea-Bissau	Somalia
Repuclic	Kenya	South Africa
Chad	Liberia	Sudan
Comoros	Libya	Tanzania
Congo, Rep.	Madagascar	Togo
Of the	Malawi	Tunisia
Congo, Dem.	Malawi	Uganda
Rep. Of the	Mauritania	Zambia
Cote d'Ivoire	Mauritius	Zimbabwe
Djibouti		

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