

Official Language, Ethnic Diversity and Industrialization in Africa: Language Policy Perspectives

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Abstract:

Does the use of non-indigenous languages (French, English, and Portuguese) as official languages affect the industrialization in Africa? This paper investigates the relationship between the average distance to official language, which captures the ability to speak an official language and the manufacturing value-added per capita of 29 sub-Saharan Africa countries. Using a panel correlated random effect and instrumental variable approaches, the paper finds that an official language distant to the most spoken language in Africa negatively and statistically affects the manufacturing value-added per capita. The policy implication of this study is that Africa's policymakers should rethink their language policy by using local languages as official languages.

Key words: Industrialization, average language distance, ethno-linguistic fractionalization, institutions.

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1. INTRODUCTION

After the end of colonization at the beginning of 1960s, most of the African countries have kept the colonial languages such as French, English, and Portuguese. A few of them, such as Ethiopia, Tanzania and Somalia are using local languages respectively Hamaric, Kiswahili, Somali as an official language. These languages are used as an official language, defined as "the language in which the primary affairs of the community-the government, the media, the courts and the school-are conducted" (Laitin & Ramachandran, 2014, p.2). However, many post-colonial African elites and politicians struggled against the non-indigenous language used as official language in the countries. The idea behind the non-acceptance of the foreign language is the preservation of the national identity (Thiong'o, 1986) and the difficulty to build a human capital able to carry out the development of Africa for Africans (Diop, 1974). For these authors since the language is the mean through which any people can develop its creativity, thinking in and using the language of someone else is somehow being alienated and hinders the possibility of innovation and creativity. Therefore, development becomes difficult to reach.

Recently, the importance of language and ethnic diversity as explaining the difference in growth between countries has become a matter of debate and many studies have started to find the correlation between language, ethnic diversity and growth (Chong, Guillen, & Rios, 2009; Easterley & Levine, 1997; Karnane & Quinn, 2017; Lee, 2012). For instance, Laitin et al. (2014) using a cross-country and micro-level analysis have found that the average distant to official language, which captures the ability to speak an official language, has a negative and statistical impact on growth and individual outcome (literacy, income...). For these authors, countries which use an official language distant to the most spoken local languages have a negative impact on growth.

Although there is a renewed interest in the field of informal institutions and their impact in cross-country growth, the existing studies focus more on formal institutions than on informal institutions. Also, for African countries, where the informal institutions are still leading the individual behavior, surprisingly, fewer studies have attempted to shed light on the importance of informal institutions, such as language, ethnic diversity, and trust in the difference in growth between countries and also in a country. For instance, Easterley et al. (1997) showed how the ethnic fragmentation led to non-optimal public policy implementation.

In this paper, we investigate the relationship between the average language distance to official language and the industrialization in Africa countries. Indeed, since the study of Kaldor (1966, 1967) the industrialization is seen as the "engine" of growth in the developing countries. The developing countries, therefore, are looking to foster the industrialization; regarding the success of some countries such as Asian countries, human capital and physical capital appear to be the most relevant determinants of industrialization and growth. The role played by the human capital is critical for these countries, particularly South Korea, which has implemented a deep education reform since 1945 (Lee, Jeong & Hong, 2018). The question is how fast can a country accumulate enough human capital to grow? How high is the cost of the human capital accumulation? Since the people have to accumulate the knowledge through the language, which is the gatekeeper of human capital accumulation, the cost and the pace by which people will learn depend strongly on how easy they could learn the language through which they will acquire the knowledge. That implies that, for the developing countries' policymakers, the choice of the official language is a crucial point for the country's wealth and growth.

Our hypothesis is that if the policy makers choose an official language too distant to the local most spoken languages, the impact will be negative on the industrialization of those countries. The language barrier will exclude a large and important part of the population from the participation in the social and economic transformation. Also, we assume that the ethnic diversity will be worsened and will negatively affect the industrial outcome. To test our hypothesis, we use a panel correlated random effect approach, since most the variables are time-invariant to estimate the regression model.

The remainder of the paper is structured as follows: the next section provides an overview of the relationship between the average language distant to official language and the growth through the industrial sector. Section 3 presents the data and the empirical strategy. Section 4 presents the results while section 5 concludes and discusses the results.

2. LANGUAGE, ETHNIC DIVERSITY AND GROWTH

Conceptually, we can think of many channels by which the language may affect the industrial outcome and economic performance, mainly the growth. A language is said to be the most significant difference between human beings and other animals. It is a very powerful means of communication through which people can interact, and increase social capital such as trust and cultural identification (Chong et al., 2009). For Chong et al. the language apart from being a mean for facilitating functioning of formal and informal institutions, and through which once can learn and accumulate human capital, is also a signal for cultural affinity; they find that a language affinity is positively associated with individual earnings.

Studies found a significant and positive relationship between English language and economic growth. Lee (2012), using a cross-sectional analysis, found that the knowledge accumulation is positively correlated with the English language proficiency. Thus, countries with higher English proficiency are likely to grow faster than others.

However, the most innovative study of the relationship between language and economic growth comes from Laitin (2000) and Laitin et al. (2014, 2015). Laitin et al. (2014; 2015) analyze the importance of the language policy in economic growth using cross sectional analysis and micro data. They constructed an index which measures the distance between the most spoken language in a country and the official language use in that country. Their analysis also takes into account the country's diversity, measured by the ethno-linguistic fractionalization index (ELF). The result shows that country using an official language which is distant to the most spoken language in the country increases the cost of human capital accumulation; thus negatively affecting the growth. Also, they found that the ethnic diversity will be worsened and have a negative impact on growth if the official language used is distant to the most spoken language in the country. This analysis is very important for countries like African countries, which are still using colonial languages, with high ethnic diversity. In Laitin et al. (2015), it is stated that "increasing the linguistic diversity reduces the probability of installing an indigenous language, and increases the probability of choosing the colonial language as official" (p.1). Indeed, African countries are still using the colonial language because of this impossibility of choosing one language among the local languages. Individuals and particularly elites and politicians do not want to give up their own language for another ethnic group language. There is a high mistrust between the different ethnic groups within African countries. This mistrust within ethnic groups may be understood not only through colonization but also by the impact of the slave trade. Nunn and Wantchekon (2011) find that the "individuals whose ancestors were heavily raided during the slave trade are less trusting today" (p.3221). That is why the ethnic groups prefer a colonial language to a domestic language. Unfortunately, the impact of choosing an official language is to increase and deepen the ethnic fractionalization; thus creating political instability and negatively affecting the growth (Karnane & Quinn, 2017). Karnane et al. (2017) claim that it is possible to overcome the ethnic fractionalization by building strong institutions which could accommodate with ethnic fractionalization and then have a positive effect on growth. In the same vein, Easterley and Levine (1997) find that the economic performance in Africa is undermined by "low schooling, political instability, underdeveloped financial systems, distorted foreign exchange markets, high government deficits, and insufficient infrastructure" (p.1203); they conclude that one of the reasons for this bad performance is the ethnic fractionalization.

As mentioned above, there is theoretical and empirical evidence for language and ethnic diversity as deep-determinant of growth in developing countries. The next section will present the data and empirical strategy used in this paper to investigate the relationship between language, ethnic fractionalization and industrialization in Africa.

3. DATA AND EMPIRICAL STRATEGY

The empirical strategy consists of measuring the effect of non-indigenous language as official language on the manufacturing value-added per capita in Africa. In our study, we use the manufacturing value-added per capita as dependent variable because industrialization is seen to be the 'engine' of growth and the experience of developing countries which successfully increased their Gross Domestic Product (GDP) are those which

have developed the industrial sector. As such, this study is supported by the idea that industrialization is the “engine of growth” (Kaldor, 1966, 1967; Kim, 1991; Amsden, 1992, 2001; Libanio, 2006; Szirmai, 2011, 2012; Otoo, 2013; UNIDO, 2016).

The main interest variable of this study is the average distant to official language and the data are drawn from the web version of Ethnologue: language of the World (Lewis, 2009). The dependent variable, manufacturing value-added per capita, comes from WDI (2019); the data for the institution quality from the Political Risk Survey (PRSV ICRG, 2019); the ethno-linguistic fractionalization data are drawn from Alesina, Devleeschauwer, Easterly and Kurlat's (2003) database. The other covariates come from Penn World Table (pw91.1). The study covers the period 1996 and 2017, through 5 periods of 5 years each.

The empirical strategy for this paper is divided into two steps:

(1) We compute the different indexes: The average distance to official language and the ethno- linguistic fractionalization index;

Following the paper of Laitin et al.(2014) and Fearon (2003), we compute the distance between two languages as below:

$$d_{ij} = 1 - \left(\frac{\# \text{ of common nodes between } i \text{ and } j}{\frac{1}{2}(\# \text{ of nodes for language } i + \# \text{ of nodes for language } j)} \right)^\lambda,$$

Where d_{ij} , is the distance between two language i and j . λ shows how fast the distance between the two languages declines as the number of shared increases. Fearon (2003) fix the number to 0.5 (use in this study). The index is between 0 (close to spoken language) and 1 (far from spoken language). Following Fearon, we use the ethnic group where share in the population is at least 1 percent.

Using the language family tree in Ethnologue, we can easily identify the linguistic lineage for a particular language and the official language. As we can see, two languages belonging to two different family trees do not have common nodes, so the distance between them equals 1. This means that it is harder to learn this language for the local people. Conversely, when two languages are in the same language family and ethnic group, they have the same number of nodes between them and the language family. So the distance between them equals 0. This means that it is easier to learn the official language. In the case of most African countries, the distance between them and French, English and Portuguese for instance equal 1, since those languages belong to Indo-European language, whereas most African languages belong to the Afro-asiatic, Congo-Niger, and Nilo-Saharan families.

Finally, we can compute the average distance to official language as below:

$$D_i = \sum_{j=1}^n P_{ij} d_{jo}$$

Where, D_i is the average distance to official language for country i ; j the number of linguistic group; p_{ij} refers to the population share of group j in country i ; d_{jo} is the distance of group j to official language. This variable is capturing the ability to speak an official language.

The second variable to be computed is the ethno-linguistic fractionalization index (ELF), following Alisena et al. (2003).

$$1 - \sum_{k=1}^K p_k^2.$$

Where $k \geq 2$, represents the different ethnic groups in the country; and p_k is the share of this ethnic group in the total population.

(2) As mentioned earlier, the paper will measure the direct effect (reduced form) of the language distance on manufacturing value-added per capita (1). The second step will be using the Instrumental variable approach to capture the local average effect of language distance (ALD) on Human capital (HC) (2); and the local average effect of ethno-linguistic fractionalization (ELF) on political stability (3). Equation 3 is the second stage 2LS regression. The results are summarized in table2.

Since the main variable of interest is time-invariant, this study uses the Panel Correlated random effect approach; in order to maintain the time-invariant variable by adding their means in the equation (Chamberlain, 1982); and run using OLS. The coefficients are equivalent to the panel fixed-effect coefficients. The cluster standards error is used to control for heteroscedasticity and serial correlation and we control for country-specific and time-specific. The regression equations are as below:

Reduced form (direct effect)

$\text{Log Manufacturing value - added per capita}_{it} = \beta_0 + \beta_1 \text{ALD}_{it} + \gamma X_{it} + \delta_1 \text{mean (ALD}_{it}) + \delta \text{me}(X_{it}) + i.$
 $\text{time} + i. \text{country} + \varepsilon_{it} \quad (1)$

First stage:

$$\text{Human capital}_{it} (HC) = \rho_0 + \rho_1 \text{ALD}_{it} + \gamma X_{it} + i. \text{time} + i. \text{country} + \varepsilon(2)$$

$$\text{Political stability}_{it} (PS) = \theta_0 + \theta_1 \text{ELF}_{it} + \gamma X_{it} + i. \text{time} + i. \text{country} + \varepsilon(3)$$

Second stage (indirect effect):

$\text{Log Manufacturing value - added per capita}_{it} = \alpha_0 + \alpha_1 \text{HC}_{it} + \beta_2 \text{PS}_{it} + \gamma X_{it} + \delta_1 \text{mean (HC}_{it}) + \delta_2$
 $\text{mean (PS}_{it}) + \delta \text{mea}(X_{it}) + i. \text{time} + i. \text{country} + \varepsilon_{it} \quad (4)$

The coefficient, β_1 is negatively correlated with the manufacturing value-added per capita. This means that the average distance to official language negatively affects the manufacturing value-added per capita. We also control for the ethno-linguistic fractionalization or ethnic diversity and institution quality. As Karnane et al. (2017) argue, the ethno-linguistic fractionalization may not be an obstacle for economic growth if the countries have a strong institution quality. Also, according to Laitin et al. (2014) the effect of ethno-linguistic fractionalization is negative and statistically significant when the official language is distant to the most spoken language. They have found that this effect may be positive and significant if the countries' language policy choose a language close to the most spoken local language. Since most of the countries in Africa are using a language far from their most spoken language in the country, we expect the ethno-linguistic fractionalization coefficient to be negative and worsening the impact of language on industrialization.

In the first stage, the coefficient ρ_1 and θ_1 are negative. The language distant is increasing the cost of human accumulation; and the ethno-linguistic fractionalization negatively affects political stability (Karnane et al.2017).

Other covariates such as agricultural and industrial land, capital stock, innovation (TFP), institution quality (protection against expropriation risks), Dummy (French, English and Africa) are used as control variables in the equation.

The next section presents the results of the regression.

4. RESULTS

Table 2 presents the results for the regression between the manufacturing value-added per capita and the average language distance to an official language; at the outset, we analyze the descriptive statistics in the table 1.

| VARIABLES | (1) N | (2) mean | (3) sd | (4) min | (5) max |
|--|----------|-------------|-----------|------------|------------|
| Manufacturing value added per capita (log) | 140 | 22.47 | 2.863 | 15.82 | 27.72 |
| Average language distance to official language | 145 | 0.935 | 0.242 | 0 | 1 |
| Ethno-Linguistic Fractionalization (ELF) | 145 | 0.656 | 0.226 | 0 | 1 |
| Political stability and absence of violence | 145 | 6.671 | 1.680 | 0 | 10 |
| Human Capital | 135 | 1.751 | 0.444 | 1.059 | 2.860 |
| Protection against expropriation risks | 145 | 5.795 | 1.717 | 0 | 10 |
| Capital stocks, at constant 2011 (log) | 145 | 11.34 | 1.437 | 8.503 | 14.75 |
| French dummy | 145 | 0.379 | 0.487 | 0 | 1 |
| English dummy | 145 | 0.483 | 0.501 | 0 | 1 |
| Agriculture and industry land area sqkm (log) | 140 | 12.68 | 1.242 | 9.222 | 14.63 |
| Innovation (TFP) | 85 | 0.463 | 0.191 | 0.148 | 0.928 |

The table shows that on average the African countries in our sample are distant to the official language they use. The mean of average language distance to official language is close to 1 (0.935). This suggests that the cost of learning and accumulating human capital is higher. Also, the ethno-linguistic fractionalization index is 0.6562 (rescaled between 0 and 1), highlighting the fact that the African countries are relatively diversified. The institutional quality is acceptable on average (5.795).

Table 2.

Table 2 presents respectively the direct effect of language and ethno-linguistic fractionalization on industrialization (Panel A); the First stage (Panel C) of the relation between respectively langue distant and human capital accumulation; and ethno-linguistic fractionalization and political stability; and the second stage (Panel B) summarizes the local average effect of language distant and ethno-linguistic fractionalization.

Panel A: Reduced Form: Pooled OLS-Fixed Effect

| | (1) Pooled-OLS | (2) OLS | (3) OLS |
|---------------------------------------|---------------------|---------------------|---------------------|
| Average language to official language | -18.44*** (2.38) | -16.46*** (1.79) | -18.44*** (1.80) |
| Ethno-Linguistic Fractionalization | -5.33** (1.75) | | -5.33* (2.52) |
| Expropriation risks absent | 0.06 (0.04) | 0.06 (0.04) | 0.06 (0.04) |
| Observations | 80 | 80 | 80 |
| R-squared | 0.979 | 0.6277 | 0.6277 |
| Controls | YES | YES | YES |
| Country FE | YES | YES | YES |
| Year FE | YES | YES | YES |

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Panel C: First stage for Human Capital & Political stability

| | (1) Human Capital | (2) Political Stability |
|---------------------------------------|-------------------------|-------------------------------|
| Average language to official language | -2.85* (1.35) | |
| Ethno-Linguistic Fractionalization | | -9.75** (3.00) |
| Observations | 80 | 80 |
| R-squared | 0.4012 | 0.1445 |
| Controls | YES | YES |
| Country FE | YES | YES |
| Year FE | YES | YES |

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

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Panel B: Second Stage

| | (1) IV1 | (2) IV2 | (3) IV1 & IV2 |
|---------------------------------------|------------------|------------------|------------------|
| Average language to official language | | -4.78+ (2.46) | |
| Ethno-Linguistic Fractionalization | -0.45 (1.24) | | |
| Human capital | 4.71** (1.61) | | 5.14** (1.70) |
| Political Stability | | 0.60** (0.19) | -1.03* (0.41) |
| Expropriation risks absent | 0.11* (0.05) | | 0.59* (0.25) |
| Observations | 80 | 80 | 80 |
| R-squared | 0.5758 | 0.3212 | 0.2103 |
| Controls | YES | YES | YES |
| Country FE | YES | YES | YES |
| Year FE | YES | YES | YES |

Standard errors in parentheses
+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001

Panel A measures the direct effect (reduced form) while Panel B measures the indirect effect.

Quite robustly, results in Panel A show a negative and strong correlation at 1% level of significance between the manufacturing value-added per capita and the average language distance to official language. This result is consistent with other studies and confirms the negative effect of the official language used by African countries in their industrialization process. Column (2) shows that an increase in the average distance to official language by 1 standard deviation reduces the manufacturing value-added per capita by 98 percent ($\% \Delta MVAcap = (e^{\beta \cdot SD} - 1) * 100$). Controlled for the ethno-linguistic fractionalization column (3), the negative effect of the language distance on the manufacturing value-added per capita is worsened and increases to 99 percent reduction.

The ethno-linguistic fractionalization reduces manufacturing value-added by 70 percent. The impact of ethno-linguistic fractionalization is quite strong and the magnitude is high. This result confirms the Easterley and al. (1997) finding and shows how important it is to take into account the ethnic diversity. The lack of good institutions in Africa makes the ethnic diversity to be a curse and strongly hinders the development process.

Panel C shows the first stage results. As expected, the language distance to official language negatively affects the human capital accumulation. As Laitin et al. (2014, 2015) suggested, the use of a language too distant to the most spoken language increases the cost of learning and the human capital accumulation is therefore reduced. The coefficient is statistically significant at the level of 1 percent. A one-standard deviation increase in the language distant reduces the human capital accumulation by 0.5 percent.

In the same vein, the ethno-linguistic is negatively and statistically, 1 percent level of significance, correlated to political stability and absence of violence. A one-standard deviation increase in the ethno-linguistic fractionalization reduces the political stability index by 1 percent.

Panel C (2SLS) shows the channels through which language and ethno-linguistic fractionalization affect industrialization. Columns (1) and (2), show that human capital and political stability positively affect industrialization respectively through the local effect of language distance and ethno-linguistic fractionalization. The negative effect of political stability and industrialization (column 3) may be due to the potential correlation between political stability and expropriation risks (Thomas, 2010).

Also, the quality of formal institutions, measured by the protection against expropriation risks, positively and statistically affects the industrialization process.

5. SUMMARY AND CONCLUSIONS

In this paper we investigate whether using an official language distant to the indigenous languages (most spoken languages) in Africa such as French, English and Portuguese negatively affects the manufacturing value-added per capita. Using data from 29 Africa countries between 1996 and 2017 (5 periods of 5 years) through a Panel Correlated random effect (OLS estimator) and instrumental variables approaches, the study findings are consistent with Laitin et al. (2014; 2015). Language policies which choose an official language distant to the indigenous languages (most spoken languages) negatively reduce the manufacturing value-added per capita by more than 90 percent in Africa.

Also, the ethno-linguistic fractionalization (ELF) negatively affects the industrialization (70 percent reduction) and worsens the language effect on industrialization (1 percent more reduction). Laitin et al. (2014) argue that this negative correlation is exacerbated when the official language is too distant to the most spoken indigenous language in the country. Thus, using an indigenous language (very close to the most spoken languages) is a remedy to make the diversity effect positive and become significantly correlated with the economic growth and manufacturing value-added per capita.

The instrumental variables approach shows that the language distance and the ethno-linguistic fractionalization affect the industrialization respectively through the channel of human capital accumulation and political stability. The language distance has a negative and significant impact on human capital accumulation; and the ethno-linguistic fractionalization negatively affects political stability.

Through the findings of this study and others, it is clear that African countries, after colonization, by using colonial languages have deepened the ethnic fractionalization which has negatively affected the industrialization process. Also, the ethnic fractionalization coupled with high mistrust (Nunn et al. 2011) makes the use of a local language as an official language difficult. This impossibility of choosing a local language maintains the colonial language, and thus increases the cost of learning, the accumulation of human capital; the social capital is then weakened.

Understanding the importance of the language policy in the difference in growth between countries is vital for policymakers in African countries. The elites and politics should be able to choose a local language, not too distant to other local languages. Also, an overall language policy should be implemented to reassure the other ethnic groups that their languages will not be endangered and will have an equal place in the society. Another crucial challenge for African policymakers is to build a social capital based on trust. For this purpose, institutional reforms to strengthen the formal and informal institutions should be carried out in an inclusive way.

In further work, it should be interesting to analyze at the micro-level how the use of official language is affecting the individual human capital and economic outcomes such as labor participation, year of schooling and literacy. This micro-analysis may shed light on how this language policy may affect individuals and be a good determinant of an increase of earnings and poverty reduction in Africa, and increasing individual participation in the society's affairs.

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