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

By

YAMEOGO, Souleymane

THESIS

Submitted to

KDI School of Public Policy and Management

In Partial Fulfillment of the Requirements

For the Degree of

MASTER OF PUBLIC POLICY

2020

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

By

YAMEOGO, Souleymane

THESIS

Submitted to

KDI School of Public Policy and Management

In Partial Fulfillment of the Requirements

For the Degree of

MASTER OF PUBLIC POLICY

2020

Professor Kim, Joon-Kyung

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

By

YAMEOGO, Souleymane

THESIS

Submitted to

KDI School of Public Policy and Management

In Partial Fulfillment of the Requirements

For the Degree of

MASTER OF PUBLIC POLICY

Committee in charge:

Professor Kim, Joon-Kyung, Supervisor

Professor Shin, Jaeun

Approval as of August, 2020

OFFICIAL LANGUAGE, ETHNIC DIVERSITY AND INDUSTRIALIZATION IN AFRICA:

LANGUAGE POLICY PERSPECTIVES

by

YAMEOGO Souleymane

Thesis

Submitted to

Master of Public Policy, KDI School of Public Policy

In Partial Fulfillment of the Requirements

For the Degree of

MASTER OF PUBLIC POLICY

August, 2020[1]

[1] The thesis is based on an article published in November 2019, in the International Journal of Business Management and Economic Research (IJBMER). Although the Journal and the chapter IV and V of the thesis share the same empirical strategy framework, the thesis widely developed the research methodology, particularly, the panel correlated random estimator (CRE) for instrumental variables; and it affected the level of significance and the magnitude of some findings. Based on the more detailed empirical strategy, I formulated strong recommendations for African countries by also taking advantage of a wide literature review on the topic and the analysis of language policies in other countries such as Latin America countries, and some European countries.

Contents

List of Tables

List of Figures

Acknowledgements

First and foremost, I would like to thank NIIED for awarding me a scholarship. I would also like to thank my supervisors Kim Joon-Kyung and Shin Jaeun for their invaluable advice and support. Their ideas were useful to reshape and well conduct my research on time.

This thesis would have been impossible without the critical comments of my econometrics Professors Hee-Seung Yang and Kim Taejon. Discussions on policy recommendations with Professor Kim Dongseok were also particularly rich and insightful. I would also like to thank Professor Plumb whose warm encouragement and insightful comments contributed to the publication of this thesis.

I am also grateful to my friend Sirri Caroline Nfornah for her support during this moment, and to all KDI family and staff for making the life in KDI bearable.

Last but not least, I would like to thank my family for putting up with my long absence during my graduate studies.

OFFICIAL LANGUAGE, ETHNIC DIVERSITY AND INDUSTRIALIZATION IN AFRICA: LANGUAGE POLICY PERSPECTIVES

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 approach, the paper finds that an official language distant to the most spoken local language in Africa negatively and statistically affects the manufacturing value-added. The policy implication of this study is that African's policymakers should rethink the language policy by encouraging the use of the local languages as official languages.

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

아프리카의 공용어, 민족 다양성, 산업화: 언어 정책을 중심으로

초록

비토착어(프랑스어, 영어, 포르투갈어)를 공용어로 사용하는 것이 아프리카의 산업화에 영향을 미치는가? 본 논문은 공용어 구사 능력을 보여주는 공용어까지의 평균 언어적 거리와 사하라 사막 이남의 아프리카 29 개국의 1 인당 제조업 부가가치와의 관계를 연구한다. 본 연구에서는 패널 상관 랜덤효과와 도구변수 추정법을 사용하여, 실제로 가장 많이 사용되는 토착어와 언어적 거리가 먼 공용어는 제조업 부가가치에 통계적으로 유의한 부정적 영향을 미친다는 것을 발견하였다. 본 연구의 정책적 함의는 아프리카 정책입안자들이 지역 토착어의 공용어화를 장려하도록 언어정책을 재고해야 한다는 데에 있다.

키워드: 산업화, 평균 언어적 거리, 민족 언어 분열, 제도

I. Introduction

At the end of colonization in the 1960s, most African countries kept colonial languages such as French, English, and Portuguese as official languages. A few of them, such as Ethiopia, Tanzania and Somalia are using local languages respectively Hamaric, Kiswahili, Somali as an official language. These official languages are defined as "the language in which the primary affairs of the community: the government, the media, the courts and the schools-are conducted" (Laitin & Ramachandran, 2014; p.2). However, many post-colonial African elites and politicians fought against non-indigenous languages being used as official languages in order to preserve their national identity (Thiong'o, 1986) and to build a strong human capital to boost indigenous African countries' development (Diop, 1974). According to Thiongo'o (1986) and Diop (1974), since language is a means through which any community can develop its creativity, thinking in and using a foreign language is some way being alienated and hinders innovation and creativity. Therefore, the language issue has become a matter of contemporary debate in the field of economics, particularly institutional economics.

Recently, the importance of language and ethnic diversity in explaining cross-country difference in growth has drawn attention; and considerable studies have thrown light on the correlation between language, ethnic diversity and growth (Easterley & Levine, 1997; Chong, Guillen & Rios, 2009; Lee, 2012; Karnane & Quinn, 2017). Although it is commonly asserted that English language fosters economic growth, this paper takes a different view and finds that if language appears to be vital for growth, previous studies (Caselli & Coleman, 2000, 2001; Crystal, 2003; Lee, 2012) failed to perfectly explain how countries, such as African English-speaking countries, with less than 20 percent of the population speaking English can achieve growth, and catch up with developed countries. In addition, Laitin et al. (2014) cast doubt on English language as a means for growth for developing countries. They build an index to capture the ability to speak any language for a given country in order to analyze the relationship between language and economic growth. Using a cross-country and micro-level analysis, they find that the average distance to official language has a negative and statistical impact on economic growth and individual outcome and, countries which use an official language too distant to the most spoken local languages exhibit lower economic growth.

Based on the study of Laitin et al. (2014), this paper intends to analyze the impact of language policy on industrialization in Africa. Language, an informal institution, plays a key

role in Africa, where more than 2,000 local languages co-exist (Lewis, 2009). Also, for African countries, where informal institutions are still leading individual behavior, surprisingly, fewer studies have underscored the importance of language distance in the difference in growth across countries. This thesis, therefore, develops the concept of language distance as a good index for measuring language.

This paper aims to contribute to the existing body of literature by providing empirical evidence of the importance of language distance to African countries' industrialization. Moreover, for policymakers' practical use, this paper highlights the crucial role of language policy, focusing on the use of domestic language to foster growth. In addition to Laitin et al., I hypothesize that international languages, for the purpose of globalization, are a compelling means to catch up with first movers (Chang, 2018; Lee, 2018).

To achieve this goal, this paper explores the following questions: Does the use of non-indigenous languages (French, English, and Portuguese) as official languages affect industrialization in Africa? By which channels does an official language affect industrialization? And what language policy should be recommended for fostering industrialization in Africa?

To answer these questions, the paper uses a panel correlated random effect approach to estimate the regression model. The key findings conform to those of Laitin et al.(2014), suggesting that non-indigenous languages used as official languages hinder African countries' industrialization. Therefore, the paper claims that the use of domestic language along with international language will not only bolster industrialization, but also facilitate technology transfer from first movers.

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

II. Overview: Language Issues and Industrialization in Africa.

1. Understanding industrialization in Africa

Industrialization in Africa should be understood regarding the national and international contexts which deeply affected the continent. The most relevant national context is that most African countries became independent from European countries at the beginning of the 1960s, under the leadership of African communists leaders (Otoo, 2013). The international context is the liberalism, free trade and Washington consensus in the 80s. These contexts deeply influenced the industrialization strategy in Africa. Before analyzing the current trend of industrial outcome in Africa, let us turn now to a short historical view of the industrialization strategy in Africa. Page (2017) divided the African industrialization history into three parts, as detailed and explained below:

Entrepreneurial state and import substitution: 1960-1980

In the 1960s, most African countries became independent and policymakers had to conduct institutional reforms and policies to achieve economic growth. Inspired by the development of eastern countries, such as Russia, planning, centralization and industrialization were seen as the key drivers of fast economic growth. Since, the private sector was quasi inexistent, the state led the economy and state owned enterprises development was the main ideology. According to Page (2017, p.83) "the centerpiece of the industrialization effort was the development of large scale, often capital intensive manufacturing industries owned and managed by the state". Motivated by nationalism and communism, the State Owned Enterprises (SOEs) were obviously developed to carry out the countries' industrialization. The idea of the import substitution policy undertaken by the post-colonial countries was to produce domestically the previously imported goods, and avoid capital flight and balance of payment deficit.

Despite efforts made by governments to develop the manufacturing sector, the results were even counterproductive and instead of being independent from imported goods, the countries became more dependent to imports and many countries experienced a balance of payment crisis. Also, the oil crisis in the mid-1970s negatively affected the countries' economic performance. Most African countries saw their debt increased during this period. This is why the Bretton Woods institutions elaborated some rules and new directions to improve the

countries' economic performance and reduce the size of the state in the economy and promote the market-based policy.

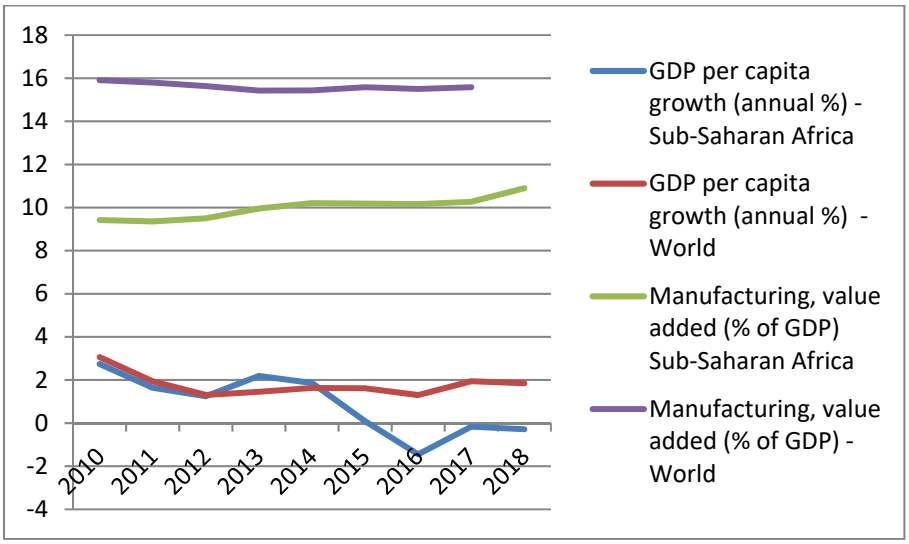
The "Washington consensus" (1980-2000) and s new directions (2000 to the present)

By the 1980s, the World Bank realized that unlike the private sector, Stated Owned Enterprises were less efficient. Stiglitz et al.(2017) explained why the divesture of SOEs was considered to be important: firstly, it reduces the 'drain on the budget'; and secondly the state is a poor entrepreneur. For Page (2017), the countries used the policy room created by the renewed importance given to 'national ownership' to innovate in their industrial policies: promote exports, target specific sectors, link industry to national resources and mainly engage the private sector. Although, the countries' policymakers have made huge efforts in promoting the industrial sector in Africa, it still faces a lot of constraints which hinder its development in the continent.

Industrial constraints in Africa

The main industrial constraints in the manufacturing sector are "availability, costs, quality of inputs; access to industrial land; access to finance; lack of entrepreneurial skills, both technical and managerial; lack of worker skills, poor trade logistics"(Dinh et al., 2012, p.55). There is a mismatch with comparative advantage and the political actors' implication is too high and creates bias. For instance, the choice of industrial park location and investment are not determined by economic nor commercial considerations but by political considerations. In addition, weak infrastructure, water shortage, and electricity outages are considered to hinder the development of industrialization in Africa (UNIDO, 2016). These constraints make African countries less competitive comparing to the rest of the world. Figure 1 shows the economic performance of sub-Saharan African countries and the world. As shown below, the GDP per capita growth of sub-Saharan African countries is lower than the rest of the world.

Figure 1. GDP per capita growth and Manufacturing value added



Source: World Development Indicators, 2019

Between 2012 and 2014, African countries exhibited a higher GDP per capita growth than the rest of the world; however, after 2014 the GDP per capita growth started decreasing to negative. Despite the manufacturing value-added (in percentage of GDP) being lower than the rest of the world, they have, however, in recent decades witnessed an increasing trend than the rest of the world.

At the beginning of the 1960s, after independence, African countries implemented different industrialization strategies. From the import-substitution strategy at the beginning of the 60s and headed by communist's leaders, to the 80s under Bretton Woods recommendations, the industrialization process in Africa still faces a lot of constraints. Having briefly reviewed the industrialization process and strategies in Africa let us now analyze the language and ethnic diversity situation in Africa.

2. Language, ethnic diversity

Africa is a multicultural and multilingual continent. According to the language family data, there are 3 main language families in Africa: the Niger-Congo (A&B), the Afro-asiatic, and the Nilo-Saharan (Lewis, 2009). In this study I do not discuss the language classification and all related ethnolinguistic debates; but for the purpose of economic analysis, this study simply uses the existing database. So, Figure 2 shows that Africa has about 2000 languages; with the largest language family being the Niger-Congo with 1542 languages, followed by Afro-Asiatic (377 languages) and Nilo-Saharan (206 languages).

Figure 2. Language family from Ethnologue language family tree

Figure 3 . Language map (local languages and official languages)

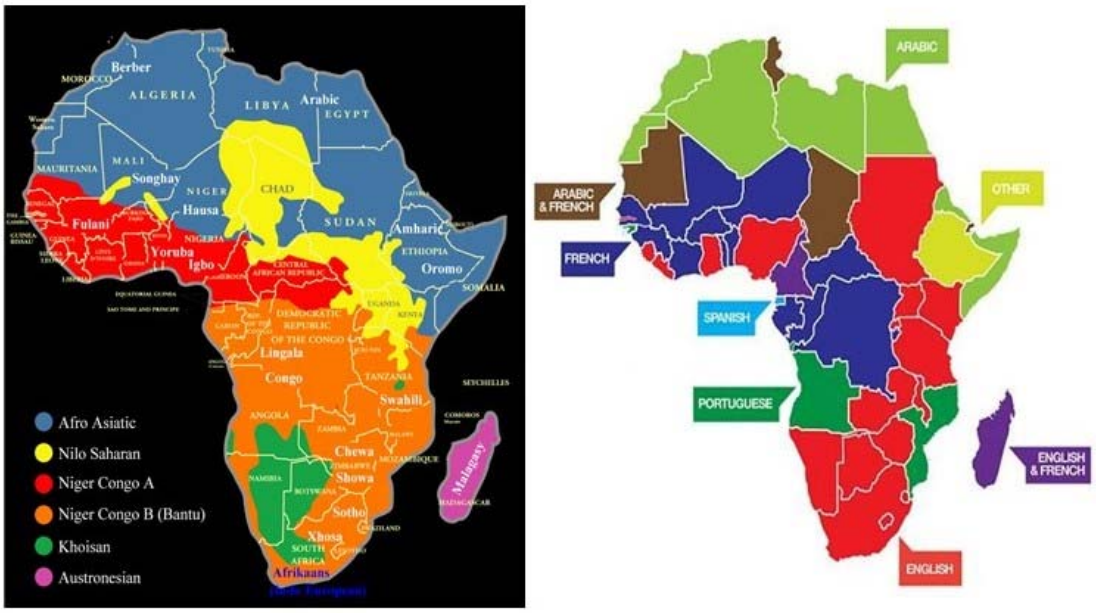


Figure 3 shows that the Niger-Congo languages are spread all over the western, central and southern parts of Africa. This means that the population living in that part of Africa can easily learn each other's language given that the different languages spoken belong to the same language family. Diop (1974) who studied the African culture in-depth found that it is easy to implement one language as an official language in Africa, since Africans have a common cultural identity and could easily exchange through the language. He also stated that Kiswahili, which is so far the most spoken language in Africa, may be Africa's official

language, since it is spoken by between 100-150 million of the continent's inhabitants. However, the official language map shows how fractionalized African countries have been and how the population from same language family groups has been separated. For example, since the official language is the language spoken in schools and public administration, countries like Burkina Faso and Ghana, covered by Niger-Congo languages, have been separated by official language. Burkina Faso's official language is French, whereas Ghana's official language is English. Educated in French and English, the population developed a language barrier, deepening fractionalization and increasing the distance between the population living in Burkina Faso and in Ghana. Using the official language only, without the use of local language, appears to hinder integration between individuals belonging to two countries where official languages are different, even when they share the same local language family. That is why the use of an official language is seen as a problem for developing local language; building national identity; and participating in public affairs (Diop, 1974; Thiong'o, 1986).

Having shed light on the industrialization process in Africa and the continent's language and ethnic diversity, the next section will discuss the main theory related to language impact on growth.

III. Literature review

1. Language, ethnic diversity and growth

Before proceeding further, it is important to clarify some important concepts necessary to understand the language effect on economic outcome. Záhořík and Teshome (2009) define some of the most important concepts including *mother tongue* as the

> Language children can speak fluently before going to school; a *community language* is a language which is the first language or mother tongue of part of the population of a country which is also used by non-native speakers in a given geographical area as a second language. A *lingua franca* is then a language used for communication by people speaking different languages. A *national language* is an indigenous language which is given recognized status by the national government for use in government and/ or education. An *official language* is the language of government business and other formal purposes in a country. (p.86)

The definitions of *mother tongue*, *community language*, *lingua franca*, *national language* and *official language* allow one to figure out the functional importance of an official language/ national language and how it may affect the whole society.

The importance of language is also related to its impact on individuals' behavior and attitudes. The Sapir-Whorf hypothesis, also called linguistic determinism, argues that there is a link between language and individuals' behavior or attitudes. According to Sapir (1958, p.69), "We see and hear and otherwise experience very largely as we do because the language habits of our community predispose certain choices of interpretation"; that is why, Whorf (1940, pp.213-214) earlier asserted that

> We dissect nature along lines laid down by our native languages…We cut nature up, organize it into concepts, and ascribe significances as we do, largely because we are parties to an agreement to organize it in this way - an agreement that holds throughout our speech community and is codified in the patterns of our language.

For this reason, Whorf (1940) continued arguing that, unless two individuals belong to a similar "linguistic background", they can not interprete the universe in the same way. Further in his analysis, Whorf(1940) stated that Indo-Europeans, given that they share a common history and have by then similar linguistic background, are more likely to have similar interpretations of things and universes. This idea is confirmed by Diop (1974) and Thiong'o (1986) who used the concept of cultural alienation to qualify the situation in African countries using foreign language(s) too distant from the most spoken local languages. They argue that it is difficult, even impossible, for Africans to innovate and develop their creativity since they are not thinking in a language which captures their realities, their environment, their history. That is why the authors think that "decolonizing the mind" is the key to improve individuals' creativity and efficiency. In addition, to the idea above-mentioned, Kahneman (2011), introducing an experiment by the psychologist John Bargh, hightlighted the fact that an idea influences an action, called the "ideomotor effect". Kahneman presented the experiment in which young people have to fashion sentences using words, and the findings are that the individuals with words related to old age behaved like old persons because "…the set of words prime thoughts of old age…these thoughts prime a behavior, walking slowly, which is associated with old age"(p.53). Finally, both the Sapir-Whorf hypothesis and the ideomotor effect show that language is crucial in shaping individuals behavior and attitude toward the world in which they are living.

This paper does not pretend to discuss main theories in ethno-linguistic area, neither to enter into controversial discussions related to the language family classification. This study rather borrows ideas from linguists in order to analyze the impact of language on economic outcome. The next section is an analysis of the relationship between language and industrialization.

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

Considerable studies have found a significant and positive relationship between English language and economic growth (Caselli & Coleman, 2000, 2001; Crystal, 2003; Lee, 2012) Using a cross-sectional analysis, Lee (2012) found that knowledge accumulation is positively correlated with the English language proficiency. Thus, countries with higher proficiency in English are likely to grow faster than others. For instance, previous studies found that developing countries by using the knowledge and innovation created by developed countries will perform well (Hall & Jones, 1999; Caselli & Coleman, 2000, 2001). In other words, developing countries could implement language policy which favors the use of the first movers' language (English, French or German) if they want to catch-up with them. This language policy approach explains why South Korea made reforms to use English as a mandatory foreign language (Chang, 2018; Lee, 2018). However, Korea maintains its national language, but uses English as a means to reduce the language distance between Korea and the United States of America. English played a key role in technology transfer and innovation in Korea in the early 60s. The role of English in fostering economic growth seems a sound approach if one considers the Korean case, particularly. Although the claims made by these studies seem compelling at first glance, this paper takes a different view and exhibits the fact that they have yet to fully take into account local languages in multicultural countries, such as African, and Latin American countries.

The most innovative study between language and economic growth comes from Laitin et al. (2014, 2015) and Laitin (2000) which cast doubt on English language as a means for growth

for developing countries. Indeed, Laitin et al.(2014, 2015) analyze the importance of language policy in economic growth using cross sectional analysis and microdata. They constructed an index which measures the distance between the most spoken language in a country and the official language adopted in that country. This paper shares this approach and defends the idea that the best measure of language, in multi-lingual countries, is the language distance index which takes into account the most spoken language in the country.

This analysis by Laitin et al. (2014, 2015) also takes into account the country's diversity, measured by the ethno-linguistic fractionalization index (ELF). The result shows that a 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 economic growth. Also, they found that 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 African countries, which are still using colonial languages though with a high ethnic diversity. Laitin et al. (2015) state 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 colonial languages because of the impossibility in choosing one language among the many local languages. Individuals and mainly elites and politicians do not want to give up their own language for another ethnic group's language. There is high mistrust between the different ethnic groups within African countries and this 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). This is why ethnic groups prefer a colonial language to a domestic language. Unfortunately, the impact of choosing an official language lies in the increase and deepening of ethnic fractionalization which creates political instability and negatively affects economic growth (Karnane & Quinn, 2017). Karnane et al. (2017) claim that it is possible to overcome this ethnic fractionalization by building strong institutions which could accommodate ethnic fractionalization and then have a positive effect on growth. In the same vein, Easterley and Levine (1997) find that 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); and they conclude that one of the reasons for this weak performance is ethnic fractionalization.

The language issue in the labor market has been also scrutinized by researchers (Isphording, 2014; Gay et al., 2015; Seid, 2017; Angrist & Lavy, 2018; Di Paolo & Tansel, 2019). Most of these studies found a positive impact of language on the labor force participation. Seid (2017) found that the use of a mother tongue has a positive impact on later labor force participation in Ethiopia. Therefore, educating individuals in their mother tongue increases their performance and their participation in the national economy. However, a too long exposure to the mother tongue, as Seid argues, may hinder the possibility to increase the proficiency in another language. That is why, along with the use of mother-tongue, an early use of other local language or foreign language will overcome the problem above-mentioned given that it is easier to learn any language at an early age (Isphording, 2014). Also, in short-term, the impact of shifting the language use in the country from the international language to the local language will face structural infrastructure and superstructure challenges, such as the change of teaching language and teachers training, the translation of books, the labor market of international companies using international languages, etc. Thus, in the short-term, the effect of the shift from international language to local language may be negative. This is the case of Morocco after the change of French as the official language to Arabic (Angrist & Lavy, 2018).

The language use policy has a lot of implications and may affect the economy in different ways. However, the body of literature shows that in general, the use of local languages has a positive impact on the economy. The next section highlights the different language policies in the world, underscoring the failures and success and the reason underlying each policies.

2. Language policy in Africa and in other regions

Language policy is a political instrument and ideologically-oriented. Hamel (2015) argues that language policy approach plays a crucial role in multilingual societies. Presenting the ideological orientations in language and cultural policy in Latin America, Hamel finds that colonialism’s ideology was to develop monoculturalism and monolingualism in the colonies. The monolingual ideology sees the existence of other minorities as a threat for national identity. Indeed, James and Lambert (2009) show that France had about 70 different ethnic groups but during the French Revolution, French language was imposed as the national language and those who were not using it were punished and considered to be against the national identity. The words of the French Minister of Public Education Anatole de Monzie, who said that "for the linguistic unity of France, the Breton language must disappear" is an

eloquent example. Like in France, the language policy in Spain followed the same path, as General Franco imposed the Castilian Spanish and declared the "speaking of languages other than Castilian Spanish to be illegal, and Basques, Catalans and Galicians were routinely ordered to 'stop barking likes dogs'" (Záhořík et al., 2009, p.89). The monolingual language use policy excluded the minority and constrained them to homogeneity. If this policy somehow was successful in some countries such as France, they failed to be realistic and to get approval or compliance from the indigenous population in other areas. In Latin America, the countries after the failure of the monolingual language policy, by using Spanish or Portuguese, were forced to come back to multilingual language use policy (Hamel, 2013). Also, Hamel makes a distinction between multilingual language use policy and plurilingual language use policy. For Hamel, plurilingual language use policy considers diversity negatively as a problem to be solved, a "barrier to national identity" whereas multiculturalism or multilingualism sees in diversity an opportunity for enrichment.

In Africa, the language issue is still a taboo in many countries and policymakers prefer not to discuss this question. The language use policy is a sensitive problem and thus far, diversity seems to be considered as a problem rather than an opportunity to be seized to build a strong national identity and good institutions. As this study has already showed, less than 20 percent of people in Africa speak the official languages inherited from France, Portugal, Germany, etc. However, those countries are called French-speaking countries, English-speaking countries, etc. Conversely some countries, such as Ethiopia have a different story. Záhořík et al. (2009) make an insightful analysis of language policy in Ethiopia. Záhořík et al. (2009) citing Bloor and Tamrat (1996)'s studies, state that there are two main factors that have shaped the linguistic profile of Ethiopia: "First, Ethiopia is the only African country that has never been colonized by a European power...Second, it is the only African country where the dominant religion is an indigenous form of Christianity" (p.84). The official language in Ethiopia is Amharic, also called "the language of the King" since it was developed during the reign of Tewodros II. Here again, the role of politics in the language use policy is crucial. The role of policymakers in African multilingual countries should promote the "shared knowledge of a single language", since " a shared language can serve as an agent of unification, a facilitator of economic development, and a symbol of nationhood" (Záhořík et al., 2009, p.98).

Along with local languages as official language, the use of the colonial language as second official language is seen as an opportunity to catch-up with developed countries (Choe, 2016;

Chang, 2018; Lee, 2018). However, this idea has failed to gain unanimity among scholars and sometimes the population. Indeed, the use of non-indigenous language as official language, even along with a national language may be seen as a threat for national identity and cultural alienation since it may create an influx of western culture in the country. Choe (2016) analyzing the language policy in Japan, Korea and Taiwan finds similarities among them. The supporters of English as second official language in these Asian countries argue that English will help catching up with first-movers and also have a significant benefit for economic performance. However, the opponents to English are afraid of the negative impact of the foreign language on national culture and identity. For instance, in 2008, Lee Myung-bak's administration tried to make English an official language in Korea, "however, such governmental efforts sparked antipathy in a considerable number of people from all walks of life, and the plan was abolished in the end" (Choe, 2016, p.11).

The above-mentioned body of studies and the countries which attempted to build a compelling language use policy shows that it is a difficult, sensitive task for policymakers. Language use policy in the context of multiculturalism is of sound importance for policymakers. Some countries succeeded to impose monolingualism on their populations, whereas some failed and were obliged to return to multilingualism, seeking to take advantage of diversity as enrichment, not as a problem. The non-use of indigenous languages in some African countries may be considered to be undemocratic since it is excluding a large proportion of the population from participation in public administration. Also, the analysis by Nunn et al. (2011) of ethnic mistrust among ethnic groups in Africa, due to the slave trade, gives an insightful understanding of the difficulties policymakers in Africa will be faced with while implementing language policy. Another difficulty is the perception of one another since abandoning one's own language may have a negative effect on minorities' self-esteem who may see themselves or be considered by the majority as inferior. These obstacles should be overcome by policymakers in Africa if they expect a successful language policy.

As discussed above, language and ethnic diversity have theoretical and empirical evidence in explaining 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.

IV. Data and Empirical Strategy

The empirical strategy of this study consists of measuring the effect of non-indigenous language as official language on the manufacturing value-added per capita in Africa. In this study, I use the manufacturing value-added per capita as the dependent variable because industrialization is seen to be the "engine" of growth and developing countries which have succeeded to increase their Gross Domestic Product (GDP) are those that have developed their industrial sector. So, 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 distance to official language and the data is 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) while the ethno-linguistic fractionalization data is drawn from Alesina, Devleeschauwer, Easterly and Kurlat 's (2003) database. The other covariates come from Penn World Table. The study covers the period 1996 and 2017, through 5 periods of 5 years each.

The empirical strategy for this study is divided into two steps: After computing the two indexes (language distance and ethnic fractionalization), I will then specify the regression model.

1. Language distance and ethno-linguistic fractionalization indexes

The first step of this study's empirical strategy consists of computing the different indexes: The Average distance to official language (ALD) and the ethno-linguistic fractionalization index (ELF).

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

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

Where d_{ij}, represents the distance between two languages i and j., λ shows how fast the distance between the two languages declines as the number of shares increases. Fearon (2003) used 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 the 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. We can notice that 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 for local people to learn this language. 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. In this case, it is easier for local individuals to learn the official language. In the case of most African countries, the distance between local languages and French, English or Portuguese for instance equals 1, since those languages belong to the Indo-European family, whereas most of African languages belong to Afro-Asiatic, Congo-Niger, Nilo-Saharan language families.

Finally, I compute the average distance to official language as follows:

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

Where, D_i is the average distance to official language for country i; j the number of linguistic groups; p_{ij} refers to the population share of group j in country i; d_{jo} is the distance of group j to the official language o. The average language distance to official language variable captures the ability to speak an official language in a country with regards to the existence of local languages.

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

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

$k \geq 2$, represents the different ethnic groups in the country, and p_k is the share of this ethnic group in the total population. The ethno-linguistic fractionalization measures the probability that if we randomly select two individuals in a country, they will not belong to the same ethnic group. The index is between 0 and 1. When ELF=0, it means that the country is homogenous, with all citizens belonging to the same ethnic group. However, when the index

is closer to 1, it means that the country is highly heterogeneous and two individuals selected randomly are likely to belong to two different ethnic groups.

2. Model specification and empirical strategy

As mentioned above, this study first measures the direct effect (reduced form) of the language distance on manufacturing value-added per capita (1). The second step involves the use of instrumental variable approach to capture the local average effect of the average 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 Table 2.

i. Panel correlated random estimator, within-between estimator

The panel data general model will be used in this study to estimate the impact of language distance and ethno-linguistic fractionalization on the manufacturing value-added per capita. The general model is as below:

$$Y_{it} = X_{it}\beta + c_i + u_{it}, t = 1, 2, \dots, T \quad (1)$$

Where X_{it} includes the time-varying variables, c_i represents the unobserved heterogeneity andu_{it}, the idiosyncratic errors. The fixed-effect model allows the unobserved heterogeneity to be correlated with the time-varying variables X_{it}, cov(c_i, X_{it}) ≠ 0, while the random effect model assumes that Cov(c_i, X_{it}) = 0. Wooldridge (2013) argues that "situations in which Cov(X_{it}, α_i) = 0 should be considered the exception rather than the rule…and FE is almost always much more convincing than RE for policy analysis using aggregated data" (p.496). Following Wooldridge's argument, this study will use a FE model to estimate the regression model. However, since the main variables of interest of this study are time-invariant, the fixed-effect panel data analysis removes them in the model.

The panel correlated random effect approach, developed by Mundlak (1978) and Chamberlin (1982), even if not widely used, is the best model which maintains the time-invariant variables and the coefficients estimates same as fixed-effect coefficients (Joshi & Wooldridge, 2019);

The correlated random effect (CRE) allows c_i the time-invariant variable to be correlated with the average level of X_{it}. So,

$$c_i = \alpha + \lambda\overline{X_i} + r_i \ (2)$$

Where, cov $(\overline{X_i}, r_i)$ =0, and c_i and $\overline{X_i}$ are correlated if $\lambda \neq 0$.

The correlated random effect combines equations (1) and (2). Substituting the former in the latter gives

$$Y_{it} = \beta X_{it} + \alpha + \lambda\overline{X_i} + r_i + u_{it} = \alpha + \beta X_{it} + \lambda\overline{X_i} + r_i + u_{it} \ (3)$$

The composite error term $(r_i + u_{it})$ consisting of a time-invariant unobservable and the idiosyncratic error is not correlated with X_{it}. Hence, the exogeneity's assumption of X_{it} holds. Also, we can notice than when λ=0, we have an ordinary random effect model. With equation (3), $\hat{\beta}_{CRE} = \hat{\beta}_{FE}$. Finally, using the correlated random effect, the study could capture the effect of time-invariant interest variable, while keeping the fixed-effect approach which underlies this paper's empirical strategy.

ii. Panel correlated random effect with instrumental variable

This study investigates the indirect effect of language distance and ethnic fractionalization on manufacturing value-added per capita in Africa. The analysis by Laitin et al.(2015) suggests along with the direct effect of language distance on growth, an indirect effect, using language distance as an instrument variable. Given that this study highlights the indirect effect of language on industrialization in Africa through human capital accumulation, I assume that the language distance only affects industrialization through the channel of human capital accumulation. Moreover, Karnane et al.(2017) shows that there is a relationship between political stability and ethno-linguistic fractionalization. Knowing the impact of institution on industrialization, this study also suggests an indirect effect of ethnic fractionalization on industrialization, through political stability. The instrumental variable assumptions will be discussed subsequently.

Before proceeding further, let us review the theoretical framework. Let's assume equation (1) and now we allow X_{it} to be correlated with the error term u_{it} . We rewrite the equation, by excluding the time-constant variable from the time-varying variable.

$$Y_{it} = X_{it}\beta + w_i\varphi + c_i + u_{it}, t = 1, 2, \ldots, T \ (4)$$

Let's assume that X_{1it} is the endogenous variable and Z_{1it} is the instrument for X_{1it}. The instrument exogeneity assumption states that Cov(z,u)=0. Since this assumption is difficult to

test, one should rely on intuition or theory to support it. The instrument relevant assumption simply shows that the first stage exists, meaning that Cov (x,z)≠0. In this case, we have

$$\mathrm{E(ci|wi,zi)} = \xi 0 + w_i\lambda + \overline{Z_i}\xi$$

$$\text{So } c_i = \xi 0 + w_i\lambda + \overline{Z_i}\xi + \alpha_i \ (5)$$

Where, w is the time-invariant variables in the equation, but not the interest variables, and τ≠0 (instrument relevant condition).

Since $Z_{1it}$is a time-constant variable, we should apply the correlated random effect approach (CRE) and equation (4) becomes (6) after plugging (5) in (4).

$$Y_{it} = X_{it}\beta + \xi_0 + w_i\lambda + \overline{Z_i}\xi + \alpha_i + + u_{it} \ , T = 1, \dots, N \ (6)$$

The CRE2SLS coefficients and the FE2SLS coefficients are equal.

$$\hat{\beta}_{CRE2SLS} = \hat{\beta}_{FE2SLS}$$

The cluster standards error may then be used to control for heteroscedasticity and serial correlation and we can control for country specific and time specific. The regression equations for this study are as seen below:

Reduced form (direct effect)

$$\log Manufacturing\ value - added\ per\ capita_{it} = \beta_0 + \beta_1\, ALD_{it} + \gamma X_{it} + \delta 1\ mean\ (ALD_i) + \delta\ mean(X_i) + i.time + i.country + \mathcal{E}_{it} \ (7)$$

First stage:

$$Human\ capital_{it}(HC) = \rho_0 + \rho_1\, ALD_{it} + \gamma Xit + \pi\ mean\ (ALD_{it}) + \delta\ mean(X_i) + i.time + i.country + \mathcal{E}_{it} \ (8)$$

$$Political\ stability_{it}(PS) = \theta_0 + \theta_1\, ELF_{it} + \gamma X_{it} + \lambda\ mean\ (ALD_{it}) + \eta\ mean(X_i) + i.time + i.country + \mathcal{E}_{it} \ (9)$$

Second stage (indirect effect):

$$\log Manufacturing\ value - added\ per\ capita\_it = \alpha_0 + \alpha_1\, HC_{it} + \gamma X_{it} + \zeta\ mean(\ ALD_i) + \tau\ mean\ (ELFi) + \varphi\ mean(Xi) + i.time + i.country + \mathcal{E}_{it} \ (10)$$

$$\log Manufacturing\ value - added\ per\ capita\_it = \beta_0 + \beta_1\, PS_{it} + \eta X_{it} + \theta\ mean\ (ELFi) + \delta\ mean(\ ALD_i) + \varphi\ mean(Xi) + i.time + i.country + \mathcal{E}_{it} \ (11)$$

The coefficient, β1 is negatively correlated with the manufacturing value-added per capita. This means that the average distance to an official language negatively affects the

manufacturing value-added per capita (instrument relevant). The choice of non-indigenous languages in Africa may be assumed to be exogenous since the partitioning of the continent among colonial countries between 1884 and 1885 in Berlin was made independently to the African countries' policy and interest. The adoption of French, English, German or Portuguese as official language by African countries is as a result of factors exogenous to their interest. The language choice is then exogenous to the countries' public policies (instrument exogeneity).

In the same vein, I investigate the ethno-linguistic fractionalization effect on political stability. Karnane et al. (2017) found a negative relationship between ethnolinguistic fractionalization and political stability (instrument relevance) and we expect the same result and direction. The instrument exogeneity approach assumes the ethnic fractionalization to be exogenous. In this case, the number of ethnic groups per country in Africa does not depend on the national policy of that country, but colonial legacy. African countries' borders were decided and made by the external forces. The number of ethnic groups per country and the nature of the fractionalization then may be assumed to be exogenous to national policy and interests (instrument exogeneity assumption).

I control in equation (7) 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 languages far from the most spoken language in the country, we expect the ethno-linguistic fractionalization coefficient to be negative and worsen the impact of language on industrialization.

In the first stage, the coefficient $\rho 1$ and $\theta 1$ are negative. The language distance is increasing the cost of human capital accumulation and the ethno-linguistic fractionalization negatively affects the political stability of the country (Karnane et al.2017).

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

The next section presents the results of the regression.

V. Results and discussion

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, let's analyze the descriptive statistics in Table 1.

Table 1. Descriptive statistics

Table1. Descriptive statistics					
	(1)	(2)	(3)	(4)	(5)
VARIABLES	N	mean	sd	min	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 African countries are relatively diversified. The institutional quality is acceptable on average (5.795).

Table 2 below presents the results of this analysis. Panel A measures the direct effect (reduced form) while Panels B and C measure, respectively, the second stage and the first stage. The main equation of this study is equation (3) in Panel A, which measures the direct relationship between the average distance to official language and the manufacturing value-added per capita in Africa.

Table 2 Regression result

Panel A: Reduced Form: Pooled OLS-Fixed Effect

	(1) Pooled OLS	(2) CRE OLS	(3) CRE OLS
Average language distance	-18.44***	-16.46***	-18.44***
	(1.80)	(1.79)	(1.80)
Ethno-Linguistic Fractionalization	-5.33+		-5.33*
	(2.52)		(2.52)
Expropriation risk absent	0.06	0.06	0.06
	(0.04)	(0.04)	(0.04)
Observations	80	80	80
R-squared	0.979	0.9791	0.9791
Control	Yes	Yes	Yes
Fixed-Effect (Time, country)	Yes	Yes	Yes

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

Panel B: Second Stage (CRE2LS)

	(1) HC	(2) PS	(3) HC&PS
Human capital	4.71***		5.30+
	(1.42)		2.94)
Ethno-Linguistic Fractionalization	-0.45		
	(2.06)		
Expropriation risks absent	0.11*		0.37
	(0.04)		(0.23)
Political stability		0.80***	-0.55
		(0.19)	0.63)
Observations	80	80	80
R-squared	0.9735	0.9436	0.9409
Control	Yes	Yes	Yes
Fixed-Effect (Time, country)	Yes	Yes	Yes

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

In Panel B above, the second stage, the regression of the dependent variable on political stability and absence (Equation 2) through the local average of ethno-linguistic fractionalization is not controlled for expropriation risk absent variable. Given that the ethnolinguistic fractionalization, an informal institution, is expected to be correlated with the political risk variables (Thomas, 2010), the coefficient estimated will not be consistent. For example, Equation (3) where the two variables have been introduced in the regression, the

coefficient of political stability became negative, implying an unlikely result which is a negative impact of political stability on industrialization.

Panel C: First stage for Human Capital & Political stability

	(1) Human Capital	(2) Political stability
Average language distance	-4.26***	-14.01***
	(0.74)	(6.15)
Ethno-Linguistic fractionalization	-1.03+	-28.97***
	(0.54)	(8.08)
Observations	80	80
R-squared	0.9508	0.7318
Control	Yes	Yes
Fixed-Effect (Time, country)	Yes	Yes

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

Panel A. Quite robustly, results in the table 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 $[\%\Delta MVAcap = \left(e^{\beta * SD} - 1\right) * 100)]$. Controlled for the ethno-linguistic fractionalization, column (3) shows that the negative effect of the language distance on the manufacturing value-added per capita is worsened and increases to 99 percent reduction. Equation (3) confirms the main hypothesis of this study that the use of a language too distant to the most spoken language in a country has a negative and significant impact on the manufacturing value-added per capita.

Additionally, the ethno-linguistic fractionalization reduces the manufacturing value-added per capita by 70 percent. The impact of ethno-linguistic fractionalization is quite strong and the magnitude is also high. This result confirms the findings Easterley et al. (1997) and shows how important it is to take into consideration ethnic diversity. The diversity in African countries, because it is not well handled by policymakers, appears to be a curse instead of being an opportunity for enrichment. More so, the lack of good institutions in Africa makes

ethnic diversity a curse and strongly hinders the development process (Karnane et al., 2017). Good institutions are said to mitigate the negative effects of ethnic fragmentation.

In Panels B and C, this study investigates two other hypotheses: (1) the average language distance to official language has an indirect effect on the manufacturing value-added per capita through its impact on human capital accumulation (Laitin et al., 2014); (2) the ethnolinguistic fractionalization impacts the manufacturing value-added per capita through its effect on the political stability in the country.

Panel C shows the first stage results. As expected, in column (1), the language distance to official language negatively affects 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, thereby reducing human capital accumulation. 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 1.03 percent. An additional result also shows a negative effect of the ethnolinguistic fractionalization on human capital accumulation. A one-standard deviation increase in the ethno-linguistic fractionalization decreases the human capital accumulation by 0.23 percent. This is an interesting finding to be investigated in-depth since it may be of great use for policymakers and researchers in Africa.

Likewise, column (2) shows the relationship between the ethno-linguistic fractionalization and political stability in Africa. As expected, the ethno-linguistic fractionalization is negatively and statistically, at 1 percent significance, correlated to the political stability and absence of violence. A one-standard deviation increase in the ethno-linguistic fractionalization reduces the political stability index by 3.17 percent. The ethnic diversity in Africa has been used by politicians and elites to consolidate their power and influence. Due to political problems, the Rwandan genocide (Tutsi against Hutu ethnic groups) is an eloquent example. The use of ethnic diversity for political gains has been one of the main binding constraints for African stability and economic growth. This is also the reason why the use of one indigenous language in Africa has been a sensitive issue for a long time and almost impossible to implement. Ethnic conflicts have deepened ethnic fractionalization and mistrust between ethnic groups.

Panel B (2SLS) shows the channels through which language and ethno-linguistic fractionalization affect the industrialization. Columns (1&2) show that human capital and political stability positively affect industrialization, respectively through the local effect of

average language distance to official language and ethno-linguistic fractionalization. Column (3) shows that the human capital accumulation is only significant when the political stability is added in the equation, along with expropriation risks absent index. The non-significance of the variables may be due to the possible correlation between political stability and expropriation risks absent (Thomas, 2010).

The test of weak instruments shows that the average language distance to official language is not a weak instrument for human capital accumulation (F-stat=33.30) whereas the ethno-linguistic fractionalization is a weak instrument for the manufacturing value-added per capita (F-stat=5.19).

The F-statistic of the first-stage equation should be bigger than 10, according to the rule of thumb, to demonstrate that the instrument is good and not weak. A F-statistic smaller than 10 exhibits a weak instrument and the solution is to find a better instrument (Wooldridge, 2013). The F-statistic of ALD (F=33.30>10). The first stage exists and the language effect on human capital accumulation is strong, significant and negative. Since the F-Statistic is greater than 10, the instrument is good, the indirect effect through human capital accumulation is a sound result. Conversely, the ethno-linguistic fractionalization is a weak instrument for political stability (the F-statistic of ELF ((F=5.19 < 10).

The results of this study are consistent with the previous empirical studies and theories mentioned above. The random correlated effect approach to panel data analysis allows measuring the effects of average language distance to official language and ethno-linguistic fractionalization, both being time-invariant variables. This approach makes the coefficient similar to fixed-effect coefficients. The findings of the main equation of our analysis shed light on the significant and negative effect of the language distance to the official non-indigenous languages used in African countries (French, English, Portuguese, German, etc.).

VI. Summary and Conclusions

1. Summary and discussions

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

Also, the ethno-linguistic fractionalization (ELF) negatively affects industrialization (70 percent reduction) and worsens the language effect on industrialization. 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 turn 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 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 the political stability.

From the findings of this study and others, it is clear that African countries, after colonization, using colonial languages have deepened the ethnic fractionalization which has negatively affected industrialization. Also, the ethnic fractionalization coupled with high mistrust (Nunn et al., 2011) makes the use of a local language as an official language difficult. The difficulty encountered in choosing a local language favors colonial languages, thus increasing the cost of learning, the accumulation of human capital, and the weakening of social capital.

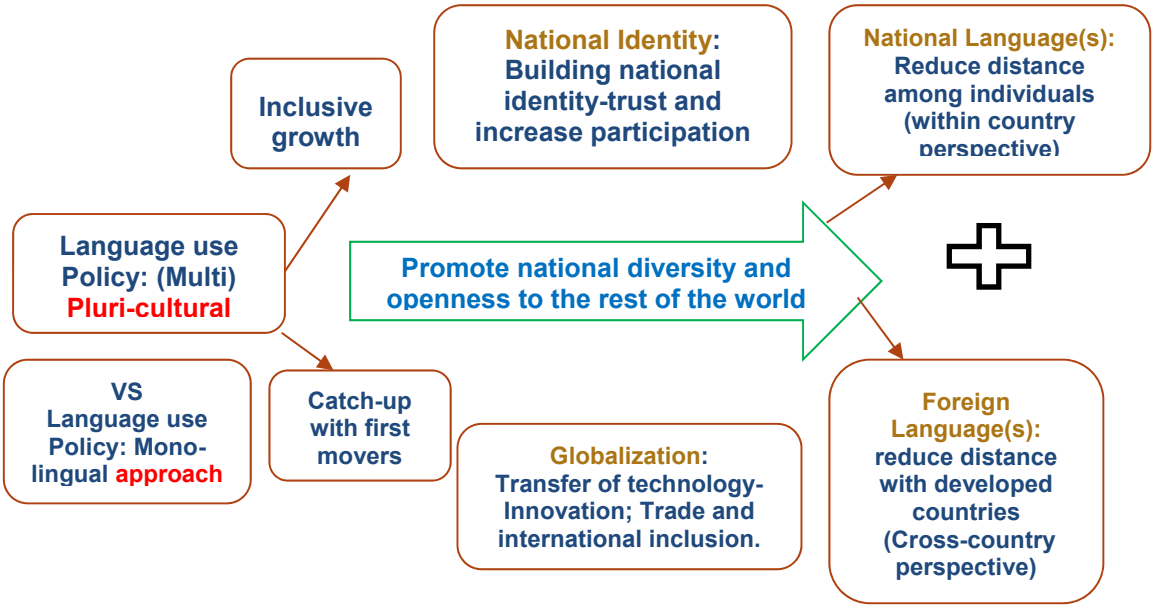
Understanding the importance of language policy in the difference in growth between countries is vital for policymakers in African countries. The elites and politicians should be able to choose a local language, not too distant to other local languages. Also, an overall language policy should be implemented 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, inclusive reforms to strengthen formal and informal institutions should be carried out and implemented.

Although this study provides empirical evidence on the importance of the use of local language in Africa, it failed to predict how the national economy of African countries will behave when using local language as official language. Also, the use of macrodata does not provide sound results on individuals' behavior toward the language change policy. Given these limitations, further research could analyze at the micro-level how the use of local language as official language is affecting individual human capital and economic outcomes such as labor participation, year of schooling, and literacy. This micro-analysis may shed light on how language policy may affect individuals, be a good determinant of an increase of earnings and poverty reduction in Africa, and increase individual participation in societal affairs.

2. Policy recommendations and strategy

The policy recommendations of this study are summarized in Figure 4 below.

Figure 4. Policy recommendation and strategy



Before proceeding further, it is crucial to mention that language policy implementation is a sensitive matter and one of the most difficult policies to be implemented in heterogeneous countries. As mentioned above in the literature review, the history of language policy implementation in some countries was violent (France and Spain); some countries, after trying to impose a monolingual language use policy, were forced to consider ethnic diversity and adopt a multilingual language use policy (Latin America, Ethiopia etc.). The policymakers in Africa have two options in implementing the language use policy: monolingualism or multilingualism in the use of local languages. The first option consists of choosing one local language as the official language and the other ethnic groups have to use this language in schools, administration and other public spaces. If this option seems to be interesting and easy to handle in terms of practicability, it will be very hard to implement in the African context, where trust between ethnic groups is weak and ethnic conflicts have for long been used by politicians to consolidate their power.

Conversely, and regarding the characteristic of African countries, a multilingual approach will be necessary, to maintain and protect local languages from extinction, and also to increase the participation of the population in public affairs and the national economy. Policymakers in Africa should think of national language (country-level language) and regional language approach (region-level language). A local language should be chosen as the official language of the country, the language in which the country should be identified and which will be considered to be the main language of central administration and public affairs, like Amharic in Ethiopia. The other languages will be the regional languages and they should benefit from the same importance and opportunities like the national official language. The big challenge for policymakers is to build a strong trust between ethnic groups, thus reducing the distance between them. The respect of other ethnic groups is crucial in maintaining a strong social fabric, the foundation of language use policy implementation success.

Along with the language use policy in African countries based on the use of local languages, the use of an international language as official language (bi-lingual official language approach) is also of great importance. Globalization requires all countries to be ready to adapt and participate in the changing world; Developing countries should be prepared to

catch-up with first movers, and this is possible only if they can acquire knowledge transfer. In this case, learning an international language (mainly English and/or French) is crucial.

Language use policy for African countries should be the top priority for the coming years, if they expect to hasten the human capital accumulation, develop knowledge and innovation, reinforce trust among population and strengthen a social fabric necessary for growth and industrialization.

References

Alesina, A., Devleeschauwer, A., Easterly, W., & Kurlat, S. (2003). Fractionalization. *Journal of Economic Growth*, *8*, 155–194.

Amsden, A. H. (1992). *Asia's next giant South Korea and late industrialization*. https://doi.org/10.1093/0195076036.001.0001

Amsden, A. H. (2001). *The rise of "The rest": Challenges to the west from late-industrialized economies*. Oxford University.

Angrist, J. D., & Lavy, V. (2018). The effect of a change in language of instruction on the returns to schooling in Morocco. *Journal of Labor Economics*, *15*(1), S48–S76.https://www.jstor.org/stable/3590195

Caselli, F., & Coleman, W. J. (2000). The world technology frontier. In *National Bureau of Economic Research Working Paper no. 7904*.

Caselli, F., & Coleman, W. J. (2001). Cross-country technology diffusion: the case of computers. *AEA Papers and Proceedings, American Economic Reviews*, *91*, 328–335.

Chang, B. (2018). Korea's language policy responses to globalization. *Journal of Pan-Pacific Association of Applied Linguistics*, *22*(2), 71–85.

Choe, H.-S. (2016). Language education policy in Korea, Japan, and Taiwan : A comparative study. *The New Studies of English Language & Literature*, *63*, 1–24. https://doi.org/10.21087/nsell.2016.02.63.1

Chong, A., Guillen, J., & Rios, V. (2009). Language nuances , trust and economic growth. *Public Choice*, (July 2009), 19.

Crystal, D. (2003). *English as a global language* (2nd ed.). Cambridge University Press.

Di Paolo, A., & Tansel, A. (2019). English skills, labour market status and earnings of Turkish women. *Empirica*, *46*(4), 669–690. https://doi.org/10.1007/s10663-019-09434-9

Dinh, H. T., Palmade, V., Chandra, V., & Cossar, F. (2012). Light manufacturing in Africa: Targeted policies to enhance private investment and create jobs. In *The World Bank*. https://doi.org/10.1596/978-0-8213-8961-4

Diop, C. A. (1974). *African origin of civilization*. Lawrence Hill & Co.

Easterley, W., & Levine, R. (1997). Africa's growth tragedy: Policies and ethnic divisions. *The Quarterly Journal of Economics*, (November), 1203–1250.

Fearon, J. D. (2003). Ethnic and cultural diversity by country. *Journlal of Economic Growth*, *8*, 195–222.

Gay, V., Hicks, D. L., Santacreu-Vasut, E., & Shoham, A. (2015). Language and female economic participation. *SSRN Electronic Journal*, *73019*. https://doi.org/10.2139/ssrn.2544396

Hall, R. E., & Jones, C. I. (1999a). Why do some countries produce so much more output per worker than others ? *The Quarterly Journal of Economics*, *114*(1), 83–116.

Hall, R. E., & Jones, C. I. (1999b). Why do some countries produce so much more output per worker than others? *Quarterly Journal of Economics*, *114*(1), 83–116.

Hamel, R. E. (2013). Language policy and ideology in Latin America. In R. Bayley, R. Cameron, & C. Lucas (Eds.), *The Oxford handbook of sociolinguistics* (pp. 609–628). https://doi.org/10.1093/oxfordhb/9780199744084.013.0030

Isphording, I. E. (2014). Language and labor market success. In *IZA Discussion Papers* (No. 8572). https://doi.org/10.1016/B978-0-08-097086-8.94033-9

James, C., & Lambert, P. (2009). France and language(s): Old policies and new challenges in education. Towards a renewed framework ? *Halshs-00439199*. https://halshs.archives-ouvertes.fr/halshs-00439199/document

Joshi, R., & Wooldridge, J. M. . (2019). Correlated random effects models with endogenous explanatory variables and unbalanced panels. *Annals of Economics and Statistics*, *134*, 243-268.

Kahneman, D. (2011). *Thinking, fast and slow*. Farrar, Strauss and Giroux.

Kaldor, N. (1966). *Cause of the slow rate of economic growth of the United Kingdom: An inaugural lecture*. Cambridge University Press.

Kaldor, N. (1967). *Strategic factors in economic development*. Ithaca.

Karnane, P., & Quinn, M. A. (2017). Political instability, ethnic fractionalization and economic growth. *International Economics and Economic Policy*, *16*(2), 434–461.

Kim, K. S. (1991). *The Korean Miracle (1962-1980) Revisited: myths and realities in strategy and development* (No. 166).

Laitin, D. D. (2000). What is a Language Community ? *American Journal of Political Science*, *44*(1), 142–155.

Laitin, D., & Ramachandran, R. (2014). Language policy and economic development. *Unpublished Manuscript*, (February), 76.

Laitin, D., & Ramachandran, R. (2015). Linguistic diversity, official language choice and nation building: Theory and evidence. *Unpublished Manuscript*, (December), 1–48.

Lee, C. G. (2012). English language and economic growth: Cross-country empirical evidence. *Journal of Economic and Social Studies*, *2*(1), 5–20.

Lee, K. (2018). Ideological dimensions of English language policy in South Korea. *Modern English Education*, *19*(3), 1–10. https://doi.org/10.18095/meeso.2018.19.3.01

Lewis, M. Paul (Ed.). (2009). *Ethnologue: Languages of the world* (16th edition). https://www.ethnologue.com/16/

Libanio, G. (2006). Manufacturing industry and economic growth in Latin America: A Kaldorian approach. *Centro de Desenvolvimento e Planejamento Regional (CEDEPLAR), Federal University of Minas Gerais, Brasil*, 1–25.

Nunn, N., & Wantchekon, L. (2011). The slave trade and the origins of mistrust in Africa. *American Economic Review*, *101*(7), 3221–3252. https://doi.org/10.1257/aer.101.7.3221

Otoo, K. N. (2013). *Industrialisation policies in West Africa*. Imprimerie COPEF.

Page, J. (2017). Industrial policy in Africa: From state leadership to investment climate. In *Industrialize Africa: Strategies, policies, institutions, and iinancing* (pp. 81–98).

Sapir, E. (1958). *Culture, language and personality*. Berkeley: *University of California Press.*

Seid, Y. (2017). Mother-tongue instruction and later labor market outcomes : Evidence from a natural experiment in Ethiopia. *Unpublished Manuscript*, 1–33.

Stiglitz, J., Yifu Lin, J., Monga, C., Zhao, C., Kanbur, R., Zhang, X., … Kere, E. (2017). *Industrialize Africa : Strategies, Policies, Institutions and Financing*. 244.

Szirmai, A. (2011). *Working Paper No . 2011 / 75 Manufacturing and Economic Development*. 3–26.

Szirmai, A. (2012). Industrialisation as an engine of growth in developing countries, 1950-2005. *Structural Change and Economic Dynamics*, *23*(4), 406–420. https://doi.org/10.1016/j.strueco.2011.01.005

Thiong'o, N. W. (1986). *Decolonising the mind: The politics of language in African literature*.James Currey Ltd.

Thomas, M. A. (2010). What do the worldwide governance indicators measure? *European Journal of Development Research*, *22*(1), 31–54. https://doi.org/10.1057/ejdr.2009.32

UNIDO. (2016). *Industrialization in Africa and Least Developed Countries: Boosting growth, creating jobs, promoting inclusiveness and sustainability*.

Whorf, B. L. (1940). Science and linguistics. *Technology Review*, *35*(6), 229–231, 247–248.

Wooldridge, J. M. . (2013). Introduction to econometrics: A modern approach (5th edition). In *Cengage Learning*. https://doi.org/10.4324/9781351140768-8

Záhořík, J., & Teshome, W. (2009). Debating language policy in Ethiopia. *Asian and African Studies*, *18*(1), 80–102.