

PhD Thesis



Università degli Studi di Macerata
Dipartimento di Economia e Diritto

**INCOME INEQUALITY,
SOCIO-POLITICAL INSTABILITY
AND FISCAL POLICY IN SSA COUNTRIES**

Supervisor: Prof. Fabio Clementi, Università degli Studi di Macerata, Italy

**Curriculum coordinator: Prof. Elisabetta Croci Angelini,
Università degli Studi di Macerata, Italy**

Doctoral Committee

Prof.

Prof.

Prof.

Prof.

Prof.

Thesis for the PhD in Quantitative Methods for Economic Policy (MQPE), XXXIII cycle

PhD Candidate: Oualy Jean Michel Roy

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DEDICATION

For my wife Edwige Oualy

who never ceased to surround me with her affection and her love throughout my studies.

For my mother Blandine Djédjé and my uncle Sébatien Ouidi

I express my deep thanks for all the support they have gave me.

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ABBREVIATIONS AND ACRONYMS

AfDB: African Development Bank

AHC: Ascending Hierarchical Classification

EBC: Electoral Budget Cycle

EU: European Union

FHI: Freedom House Index

GDP: Gross Domestic Product

GMM: Generalized Method of Moments

HCMP: Hierarchical Classification on Main Components

IMF: International Monetary Fund

OECD: Organization for Economic Cooperation and Development

OLS: Ordinary Least Squares

PBC: Political Business Cycle

PCA: Principal Component Analysis

SPI: Socio-Political Instability

SSA: Sub-Saharan Africa

SWIID: Standardized World Inequality Indicators Database

UN: United Nations

UNU-WIDER: United Nations University World Institute for Development Economics Research

USA: United States of America

WB: World Bank

WDI: World Development Indicators

WGI: World Governance Indicators

WIID: World Income Inequality Database

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ABSTRACT

The thesis is a contribution to the analysis of the political economy of distribution in Sub-Saharan African (henceforth SSA) countries. The sample of the research is the 47 SSA countries for the period 1990 to 2018.

The Socio-Political Instability (henceforth SPI) crises constitute one of the greatest problems of African countries. According to the economic literature, these crises, grouped in SPI, are caused by the high level of inequality. The SPI also impacts fiscal policy, and this fiscal policy can reduce income inequality and SPI. The research allows us to relate these three variables (income inequality - SPI - fiscal policy). It also allows us to examine how fiscal policy can overcome income inequality and address the issue of SPI in three chapters.

The first chapter constructs the index of SPI using the Principal Component Analysis method. We then estimate the SPI concerning income inequality and democracy. The findings are that assassinations are not linked to a regime's duration, and the duration of a regime reduces if coup d'état (successful or not) are rampant. Between democracy and income inequality, the former has 34 times more impact on SPI. GDP growth increases SPI and education reduces SPI.

In the second chapter, the Electoral Budget Cycle (EBC: impact of the electoral cycle on fiscal policy) of SSA countries is analysed. We use a dynamic panel model that we estimate with the Generalized Method of Moment (GMM) of Blundell and Bond (1998). We find that the EBC is opportunist for social expenditure and tax revenue. It means that during the election period, social expenditures increase and tax revenue decreases. Rent seeking (profit from non-productive activity, measured here by corruption) has an important place in the EBC. Significant decisions regarding tax revenue and social expenditure are based on rent seeking. Politicians are not intended to be of any general interest, they follow their personal interest, which is the growth of power.

The third chapter allows us to verify whether fiscal policy variables (taxes and social expenditures) and democracy reduce income inequality through a linear panel model. The results indicate that the democracy regime reduce very little income inequality in SSA countries (1 per cent). The tax policy increases income inequality, hence it is regressive. More SSA countries become rich, more income inequality increases. In these countries, the distributive policies don't reduce income inequality but increase it.

Keywords: Income Inequality, Socio-Political Instability, Fiscal Political, Democracy

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GENERAL INTRODUCTION

"Highly unequal societies are less likely to consolidate democracy, and may end up oscillating between regimes and suffer substantial fiscal volatility".
Acemoglu and Robinson (2001, p.938).

A society in which income inequality is high is threatened with Socio-Political Instability (henceforth SPI). This instability leads governments to manipulate fiscal policy to guarantee their re-election. That's why, social cohesion must be maintained by applying an appropriate redistribution policy.

The relationship between inequality and political instability is bilateral: inequality is at the root of the troubles and inequality is also the consequence of unrest.

Krugman (2007) is concerned about the extreme concentration of income and wealth which is fundamentally incompatible with real democracy because this advantage of having high incomes is passed down through generations, thus reinforcing the cycle of privilege.

This is why Acemoglu and Robinson (2012) argue that the increase in income and wealth inequality leads to illegal political power. Acemoglu and Robinson (2000, 2001) argue that in a dictatorship, with a high level of inequality, the poor can make a revolution to wrest power from the rich (the elite). And the wealthy, after losing everything, can foment a coup d'état to return to power.

Inequality can cause political and economic instability and undermine social consensus (Persson and Tabellini, 1994; Easterly, 2007; Berg, Ostry and Zettelmeyer, 2012). The authors find that there is a solid relationship between inequality and political instability, this causal relationship is from inequality to political instability. This observation is made for both developed and developing countries (Pushan and Devashish, 2008).

Collier et al. (2010) confirm this observation when they emphasize that inequality generates hatred and revolt which make it difficult to build nation states in Africa. Azam and Hoeffler (2002) show that most rebellions question the distribution of resources. People who feel aggrieved by the system believe that by coming to power, they will be able to correct this injustice. High level of inequality leads to social and political conflicts.

To all of this Stiglitz (2012) concludes that "the inequality is cause and consequence of the failure of the political system, and it contributes to the instability of our economic system, which in turn contributes to increased inequality - a vicious downward spiral into which we have descended".

It is therefore important to resolve these two scourges: income inequality and SPI. Economic literature suggests reducing inequality through fiscal policy, so there will be no social unrest and turmoil.

On this subject, the liberals and the Keynesians are opposed on the theoretical level: for the first, the market mechanisms are enough to regulate the economy, the intervention of the State in the economy would be to aggravate the imbalances. For Keynesians, only the state can correct economic imbalances. In practice, it is the Keynesian vision that is chosen by the rulers. Fiscal policy is seen as an effective instrument for reducing inequality. Thus, to resolve the inequality - SPI duo, it is necessary to reduce inequalities using redistributive fiscal policy (Atkinson and Silva, 1997; Tanzi and Chu, 1998; Tanzi, Chu and Gupta, 1999; Gupta and al. 2014).

There is a problem with implementing fiscal policy to reduce income inequality and SPI. The problem is that fiscal policy depends on the political ambitions of governments.

During the electoral period, the rulers manipulate fiscal policy with the aim of being re-elected: it is the Electoral Budget Cycle (henceforth EBC). Regardless of the economic consequences of their decision, the goal is the re-election. Political parties "do not seek to gain office in order to carry out certain preconceived policies or to serve any particular interest groups; rather they formulate policies and serve interest groups in order to gain office." (Downs, 1957 p.137).

The rulers are aware that the economic situation during an election period has effects on the probability of their re-election. This is why they use the variables of fiscal policy to achieve economic objectives in order to be re-elected.

The electoral cycle models were developed by Nordhaus (1975) in his theory of political and economic cycles. These models establish the foundations of the EBC. Nordhaus (1975) argues that the rulers increase public spending, reduce taxes and revive the economy before the election deadline in order to be re-elected. After the elections, they cut public spending and raise taxes. All this in disregard for respecting macroeconomic balances.

Thus, we are witnessing an increase in unproductive spending, a larger size of the public sector, an unequal redistribution of income and wealth in the pre-electoral period. We are also witnessing an increase in taxes and a reduction in public spending in the post-election period.

There is a bilateral relationship between income inequality and SPI. Fiscal policy, which is the right instrument for tackling inequality in order to resolve the issue of SPI, is itself conditioned by the electoral period. Fiscal policy instead of reducing inequality (to avoid unrest) creates inequality because it is conditioned by the accession to power.

What orientation should be given to fiscal policy under these conditions to reduce income inequality in order to overcome SPI? This is the research question around which our thesis is organized.

We use three variables: Income inequality, SPI and fiscal policy. These three concepts should be defined to delimit our subject and agree on the content of our thematic.

SPI comes in three forms (Taylor et al., 1972; Gupta, 1990). Instability of the elite or the executive which encompasses, coup d'état, government changes and crises; mass instability which corresponds to social movements such as strikes, demonstrations or riots; finally, the armed instability taking into account the civil war and the guerrillas, and any violent political action.

The observation that we make in the case of Sub Saharan African (henceforth SSA) countries is that SPI generally comes from elections. Analysis of data from political regimes (Polity IV) shows that the majority of SPI in SSA countries comes from elections. SPI manifests most in SSA when it comes to gaining power. The elections in SSA are accompanied by unrest, demonstrations, assassinations, civil wars. The most recent SPI are in Guinea with demonstrations and eight (8) deaths and in Cote d'Ivoire with arrests of opponents in 2019-2020. Among the cruellest socio-political instabilities, for only the last seven years (2010-2017), we can cite the Ivorian "post-electoral crisis" of 2010-2011 which resulted in 3000 deaths and millions of displaced persons (UN). In Nigeria, the April 2011 election sparked violence in the Northern provinces, killing more than 800 people in just three days.

A civil war costs on average more than thirty years of Growth Domestic Production (henceforth GDP) growth in a developing country and reduces its growth by about 2.3% per year (Collier et al., 2010). Conflicts and civil wars represent "reverse development" (World Bank 2011). Added to this are the costs associated with the destruction of production infrastructure (hydroelectric and telecommunications facilities, roads, homes, schools, hospitals, etc.). SPI leads to high unproductive spending. The resources used to ease tensions and combat conflicts could be used to finance economic development projects and improve the social security system (Barro et al., 1996; Mankiw, 1999).

SPI is so cruel in SSA that it forces people to choose between certain death and refuge (Efonda, 2002). In 2015, 200,000 left Africa for Italy via Libya (crossing the desert and the Mediterranean). More than 4,000 people died in the Mediterranean in 2015 (United Nations). SPI is a real brake on the development of African countries.

We use the Principal Component Analysis (henceforth PCA) method to establish the SPI index for SSA countries. To better appreciate the characteristics of the SPI between the different SSA countries, we use the hierarchical classification on the main components. It allows us to analyse the similarities and differences between countries in terms of SPI.

Income inequality, also known as economic inequality, is the differential access to economic resources. It is the form of inequality related to different forms of income, wealth and wages. Non-income inequalities, also called social inequalities, are differentiated access to non-economic resources. Non-income inequalities are the differences in living conditions between individuals according to sex, work, health, housing, education, training, family situation, culture, opportunities, life expectancy...

There are several measures of income inequality: measures of disparities and dispersion; Gini's index, measures of entropy.... Among all these measures, we chose the Gini index because it is the most used measure and it is the measure for which we have enough data for SSA countries. The Gini coefficient weights identically the individuals at the top and the bottom of the distribution. It is not very sensitive to extreme inequalities in distribution. The Gini index also satisfies the Pigou-Dalton-Lorenz condition. This condition stipulates that the transfer of income from a rich to a poor causes a decrease in inequality. This property, which the Gini index has allows us to check whether transfers and taxes reduce inequality in SSA.

The situation of income inequality in SSA countries is very worrying (IMF 2015).

While more than half of Africans live below the poverty line, the share held by the richest 1% reaches around 54% of the GDP (Piketty, 2014).

" Although the average unweighted Gini for SSA declined by 3.4 percentage points between 1991 and 2011, SSA remains one of the most unequal regions globally. "(Odusola et al., 2017 page ii). Africa ranks second in the world after Latin America in terms of income inequality.

Inequality in Africa is characterized by the presence of seven economies with extremely high levels of inequality. These are South Africa (0.64), Namibia (0.58), Botswana (0.57), the Central African Republic (0.54), the Comoros (0.54), Zambia (0.54) and Lesotho (0.53).

A report of the African Development Bank (AfDB) stated in 2012 that in all African countries, the richest populations are carving the lion's share in terms of income. Income inequality in Africa is striking. The most worrying thing about this high level of inequality in SSA is that it has been stable for almost three decades and the situation has not improved over time (AfDB, 2012). "The richest 0.0001% own 40% of the wealth of the entire continent. Africa's three richest billionaire men have more wealth than the bottom 50% of the population of Africa, approximately 650 million people... The World Bank estimates that 87% of the world's extreme poor will be in Africa by 2030, if current trends continue." (Oxfam, 2019, p.3).

Inequality has a negative effect on economic growth in SSA. Real GDP per capita growth in sub-Saharan African countries could increase by almost one percentage point per year if inequality were reduced to the levels seen in dynamic countries in Southeast Asia.

Extreme income disparities slow the pace of poverty reduction and hinder widespread development. Poverty and high inequality are also likely to lead to conflict. "Inequality can create imbalances in voice, representation, opportunity and access that disenfranchise segments of the population, and undermine trust in (and support for) democracy. This kind of alienation can also increase support for populist and extremist views and violent conflict" (Menocal 2017). Rising inequality is both a moral and an economic issue that affects the general health of the economy.

This high level of inequality generates social exclusion for the poor that feeds social polarization. An African from SSA identifies himself with its ethnic group, its tribe, its region and its religion instead of identifying himself with the nation. The distances between groups are very important in term of their impact on social cohesion in SSA countries. Economic, religious or ethnic polarization within SSA countries is a major source of conflict. Esteban and Schneider (2008) define the polarization as the extent to which the population is clustered around a small number of distant poles. The most commonly employed measure of aggregate ethnic diversity is the fractionalization, defined as the probability that two individuals selected at random from a country will be from different ethnic groups (Fearon 2003). In our research, we will take into account the polarization, the fractionalization and the dominance as determinants of SPI and because they are linked to income inequality.

Fiscal policy is an element of economic policy. It determines at the same time the expenses of the State through its operating expenses, investment expenses and social expenses and its revenues through the collection of taxes. We choose to deal with fiscal policy because in its conception, it is the most suitable for reducing income inequalities according to the economic literature. Fiscal policy through its distribution policy is theoretically more effective in reducing inequalities than any other economic policy instrument.

During the election period, it is the fiscal policy that is most manipulated by the leaders. Compared to monetary policy, it is easily accessible and produces immediate results. For reasons of data availability, we only use three fiscal policy variables: social spending, research and development spending and tax revenue.

While the continent is taking advantage of a chance to access development. The high level of income inequality and SPI poses a social, political and economic threat to SSA countries.

The region has experienced strong economic growth over the past two decades (5% on average from 1995 to 2015: IMF, 2015) and has recovered very well from global recessions. After the IMF, which evokes the return of strong growth and a rebounding Africa, the UN is also betting on the acceleration of African growth.

For its development, Africa has two assets: a vast internal market and varied resources.

The sub-Saharan continent will have nearly 2 billion inhabitants by 2050, one fifth of humanity. In a world where the majority of the population tends to age, the African youth represents more than 70% of the inhabitants of the continent. This constitutes an unprecedented opportunity for economic development in terms of the consumer market and human capital.

The continent is one of the areas richest in raw materials on the planet. There are 97% of the world's copper reserves, 80% of those of coltan, 50% of those of cobalt. Africa has gigantic drinking water resources and hydroelectric potential. The many fertile lands, the vast expanses of forests and savannahs represent an opportunity for agriculture and food self-sufficiency.

These resources represent a source of hope for the future of Africa.

According to Chinese economist Justin Yifu Lin, Africa has the cards in hand to ensure its economic development. The continent has all the assets to achieve an economic development similar to that of China (China was as poor as the continent thirty years ago).

However, these opportunities coexist with high income inequality¹ and SPI which constitute a real danger for the development of Africa. This requires an appropriate fiscal policy to reduce income inequality in order to reduce SPI.

OBJECTIFS

The overall objective of this research is to analyse how fiscal policy can overcome income inequality and SPI in SSA countries.

That notwithstanding, the proposal has three sub-objectives:

- Analyse the impact of income inequality on political instability in SSA.
- Determine the nature of the EBC in SSA.
- Propose fiscal policy to reduce inequality income SSA.

¹ "Africa is rising, but Africans are not, and this must be changed" (Oxfam, 2019, p.27).

HYPOTHESES

We also list three hypotheses for our research:

- Hypothesis 1: Income inequality is the cause of SPI in SSA.
- Hypothesis 2: The EBC is opportunistic in SSA.
- Hypothesis 3: Fiscal policy reduces income inequality in SSA.

In the economic literature, our research is part of political economy because we analyse the effect of politicians' activities on the economy. Since we are dealing with the distribution of income, our research falls precisely into the analysis of the political economy of distribution.

Our contribution is at two levels: theoretical and empirical.

At the theoretical level, several authors (Barro et al., 2000; Alesina et al., 1996; Acemoglu et al., 2005) have carried out research on SPI. These authors concluded that it is timely to conduct research on the relationship between income inequality and SPI.

The connection of an economic variable with an institutional variable is generally made between income, economic growth, GDP, a social variable (education, health) and democracy. Research on inequality in relation to political instability and fiscal policy for SSA countries appears to be new in the economic literature.

At the empirical level, the first contribution is the measurement of the SPI of 47 SSA countries for the period from 1990 to 2018, using the PCA method. We also use the hierarchical classification on the main components to analyse the similarities and the differences between the countries. The econometric part allows us to assess the EBC only in SSA countries.

Our research is structured in three chapters.

The first chapter allows us to analyse the relationship between income inequality and SPI in SSA. Following the observation made on the existence of troubles and crises, we establish the index of SPI for SSA countries. The second step will be to look for the cause of SPI. We assume that it is income inequality (as mentioned in the literature), so we check whether income inequality is a cause of SPI. In this we are inspired by the model of Alesina et al (1996).

In the second chapter, we check how SPI manifests itself, we look for the effect of SPI on the economy. To do this we use the EBC which is the effect of SPI on the conduct of fiscal policy. During election periods, fiscal policy variables are manipulated in order to be re-elected.

Fiscal policy is proposed to reduce income inequality in order to solve the problem of SPI. Chapter three, entitled fiscal policy and income inequality, addresses the issue through a linear panel econometric model.

CHAPTER I

INCOME INEQUALITY AND SOCIO-POLITICAL INSTABILITY IN SUB-SAHARAN AFRICA

“Growing inequality within most countries around the world is one of the critical issues facing the world today. People everywhere sense that it is morally wrong. We sense that it cannot be justified. We sense that it is dividing our societies and undermining our democracies. ”

Stiglitz (2012, p.1)

INTRODUCTION

The issue of the income inequality – Socio-Political Instability (henceforth SPI) is important for SSA countries because of its social, economic, political and ethical implications. SPI in SSA is linked to income distribution.

From independence (1960) to 1990, military and civil coups d'Etat, uprisings took place to require alternation or a better distribution of resources. The advent of the new wave of democratization in Africa in the early 1990s increased the number of elections. Elections lead to the deaths of people, to killings, to murderous clashes, to civil wars and to coups d'Etat. Recently (2020) elections in Côte d'Ivoire and in Guinea, to mention but a few, have resulted in violence, loss of life and significant material damage.

There are other causes of SPI listed in the literature. SPI can be based on identity, ethnic or religious considerations. We can cite the case of South Africa, Rwanda, Liberia, Nigeria or Casamance in Senegal. The instability within states results from the identification of people within the same group and the opposition to the other groups. Fractionalization, Polarization, concentration and dominance have impacts on intrastate instability. This phenomenon is the cause of most SPI in SSA.

In reality, the fundamental motive that drives people to rise up is the demand for a fair share of economic resources. Populations from the same tribe, belonging to the same religion or sharing the same political ideology rise up to claim their share of the wealth of the country. Inequalities bias institutions and weaken the social contract between citizens and the state and lead to the undermining of social cohesion (Krugman, 2007).

Inequalities prevent disadvantaged groups from expressing themselves properly. It is the elites, the power who succeed in putting their ideas out. They use all means such as intimidation and imprisonment of opponents, confiscation of the press, prohibition of public demonstrations, etc.

Poor people¹, who constitute the vast majority of the population in SSA countries, use violence to express themselves and assert their rights. They carry out strikes, repeated demonstrations, breakages ... to disturb public order in order to be heard and successfully impose their ideas.

Anne Krueger, first deputy managing director of the International Monetary Fund in 1997, said that poor people are ready to do anything to improve their material conditions in a situation of high inequality (Krueger, 2002). In the famous phrase of Louis Brandeis in 1941, a judge of the Supreme Court of the United States: "We can either have democracy, or have great wealth concentrated in the hands of a few, but not both" (Nader, 2000).

¹ Defined as those living on less than 1.90 dollar a day (Ferreira et al. 2016).

These previously mentioned reasons lead us to analyse income inequality as a potential cause of SPI.² Although economists and policy makers are increasingly realizing the importance of economic performance in improving the quality of political institutions, there is relatively little work on the determinants of political institutions (Acemoglu and Robinson, 2001). Muller and Seligson (1987), Alesina and Perotti (1996) and Dutt and Devashish (2008) found that there is a correlation between inequality and political instability. To our knowledge, the relationship between income inequality and SPI in SSA has not yet been object of research.

The general objective of this chapter is to analyse the impact of income inequality on SPI in SSA countries.

Specifically, we analyse the impact of democracy, fractionalization, polarization and concentration on unrests and the impact of the reduction of income inequality on SPI.

To achieve these objectives, we establish two hypotheses: the first hypothesis is that democracy does not prevent political crises in SSA, on the contrary, it contributes to increase SPI. Reducing inequality can significantly reduce SPI.

The chapter is divided in two parts. In the first part, we expose the theoretical and empirical debate on income inequality and SPI. This literature review allows us to measure the SPI using the Principal Component Analysis (henceforth PCA) method. This approach is new for SSA countries. In the second part, we estimate the SPI in relation with income inequality, democracy, fractionalization and concentration. We use the model of Alesina and Perotti (1996).³

² Alesina and Perotti (1996 page 1206): " more unequal societies are more politically unstable ... political stability is enhanced by the presence of a wealthy middle class."

³ In the economic literature, SPI is analyzed in relation to investment and economic growth. Alesina and Perotti (1996), Fosu, (1992, 2002); Barro, (1991) argue that political tensions have a direct negative impact on the accumulation of private investment and productivity, indirectly affecting growth. Our approach (income inequality - SPI) is new.

I) THEORETICAL FRAMEWORK

Both theoretical and empirical literature abounds with studies that have examined the place of institutions in the process of economic development and social stability. We present how SPI, income inequality, fractionalization, polarisation and concentration in SSA have been addressed in the economic literature.

1) SOCIO-POLITICAL INSTABILITY

1.1 Socio-Political Instability concept

The variables such as SPI are not easy to be defined and measured because of the composite nature of the concept. SPI can be seen in two ways: the first emphasizes executive instability and the second is based on indicators of social unrest and political violence.

The first approach of SPI highlights the frequency of regime change. These changes can be constitutional, happen according to the law, or unconstitutional, that is, occur from a coup d'état⁴. A high propensity of executive change results in high political instability. This first approach of SPI can be measured by probit regressions. Subsequently, the probability of change in executive power is linked to several economic, socio-political and institutional variables (Cukierman et al., 1992; Edwards and Tabellini, 1991).

The second approach to measuring political instability does not directly relate to the changes in executive power. It is the construction of an index that sums up various variables that capture social unrest. This index is calculated according to riots, assassinations, political unrest ...

Two methods are used to construct the SPI index: the method of determining the probability of the occurrence of political instability and the PCA method.

The first method (Azam et al., 1996) is carried out in two stages: first the creation of a dichotomous variable and then the estimation of the probability of realization of this variable according to explanatory variables (expenditure of health, schooling rates, etc.).

The second method, the PCA method, is implemented by Hibbs (1973), Fosu (1992) and Alesina and Perotti (1996). This method is used by several authors: Viennes and Gupta (1986); Gupta (1990); Barro (1991); Ozler and Tabellini (1991); Benhabib and Spiegel (1992); Mauro (1993). We use the PCA method to measure the SPI because the creation of a dichotomous variable to measure SPI have some limits.

⁴ Angelopoulos and Economides (2008); Beck et al. (2000); Treisman (2000).

Azam et al., (1996), in their work entitled “Political risk and growth in Africa”, prefer to use a probit model to estimate the probability of a country falling into political instability and they use this variable as an index of political instability. Fosu (1992) uses a binary variable to estimate the impact of political instability on growth in SSA. In a study carried out on Côte d’Ivoire, Kouakou (2010), calculates the index of political instability using a binary variable. The index takes the value 1 in the event of political instability and 0 otherwise.

Gouenet (2014) broadens the binary variable method used by Kouakou (2010), drawing inspiration from the method used to calculate the UNDP human development indicator. Unlike the UNDP development indicator method where the same weighting is assigned to each variable, Gouenet (2014) assigns different coefficients depending on the impact of each instability factor on the economy. When no instability factor occurs in a year, it assigns the value 0 to the SPI variable. When all these elements are combined over the course of a year, the variable instability takes a maximum value 1.

Lalime (2010) uses the indicator variable method: an indicator variable takes the value 1 if at least one of the usual characteristics of political instability has been observed and 0 otherwise. These characteristics are: coup d’état, political assassinations, untimely demonstrations, political protests and strikes, arrests, political repression and military spending.

This approach (measuring political instability by a binary variable of 0 and 1) has the disadvantage of giving the same weight, or even the same effect, to all the variables that constitute the political instability. Some of them, like genocide, had much greater impacts than others (mere protests). This dichotomous measure of political instability does not fully exploit all the informational values of SPI. It is for this reason that researchers propose the PCA method to measure the SPI.

The advantage of this method lies in the fact that it makes it possible to identify variables which best explain the largest possible part of the variability of SPI. We could have a multi-collinearity between the variables because they are very close to each other. The proximity of the variables comes from the fact that they explain the same phenomenon. Correlation between variables means repeating the information. The PCA method, by determining weights for each variable inserted, makes it possible to sort the information. The main components are new variables, linear combinations of the initial variables, not correlated with each other (they are orthogonal to each other: each of them has information which is not explained by the others).

A reference of the political instability index calculated with the principal component method (the second method) is Hibbs (1973). It builds the collective protest index using riots, anti-government demonstrations and political strikes.

Barro (1991), one of the first to measure political instability does so simply by using the number of assassinations (expressed in million of population per year) and the occurrence of violent revolutions and coups (per year). He finds that the frequency of coups and the number of political assassinations negatively influence growth.

Alesina and Perotti (1996) extend Barro's (1991) approach to better explain political instability. They use the PCA to build a weighted average of variables that capture political unrest: mass violence, political assassinations, coup d'état and a measure of dictatorship. The choice of these variables is to capture the idea of political instability as a danger to private law. Alesina and Perotti (1996) build their SPI index using data of Gupta (1990) from 1960 to 1985.

The SPI index of Alesina and Perotti (1996) and that of Gupta (1990) differ in three aspects: the country samples are different; Gupta (1990) uses discriminant analysis; and he includes many more variables (the number of political demonstrations against a government, the number of riots, the number of political strikes, the number of politically motivated attacks, the number of political executions). Despite these differences, the two indices are 83% correlated.

Fosu (2002) also uses the PCA method to build the SPI. He uses the frequencies of coup d'état, involuntary changes of government; aborted coups and failed coup.

1.2 Measure of Socio-Political Instability using the PCA method

The variables used to construct the SPI index are as follows:

$$SPI_{it} = \tau_1 SCOUP1_{it} + \tau_2 ATCOUP2_{it} + \tau_3 PCOUP3_{it} + \tau_4 AGCOUP_{it} + \tau_5 REBOUTEX_{it} + \tau_6 ASSASSEX_{it} + \tau_7 DURABLE_{it} + \tau_8 NDEATH_{it} + \tau_9 REPRESS_{it} + \tau_{10} NKILL_{it} \quad (1.1)$$

Table 1: Variables of equation (1.1)

	DESCRIPTION	SOURCE
SCOUP1_{it}	Successful Coups d'Etat	Center for systemic peace
ATCOUP2_{it}	Attempted Coups d'Etat	
PCOUP3_{it}	Coups d'Etat Plots	
AGCOUP_{it}	Subversion of the constitutional order and the imposition of an autocratic regime	
REBOUTEX_{it}	Rebel forces fighting against forces loyal to the regime	
ASSASSEX_{it}	Assassination of Executive	
DURABLE_{it}	Regime Durability	
NDEATH_{it}	Number of persons killed in an event	Social Conflict Analysis Database
REPRESS_{it}	Government use repression or violence against participants in an event	
NKILL_{it}	Number of total confirmed fatalities caused by terrorists	Global Terrorism Database

Alesina and Perotti (1996) use five variables to build the SPI index using the PCA method.⁵ To these variables, we add the other five variables to consider the specificity of SSA countries. Presidents, at the end of their mandate, change the constitution to continue staying in power. The other concepts we take into account are the rebellions and the terrorisms which are numerous in SSA. The terrorism in the Sahel region (Burkina-Faso, Chad, Mali, Mauritania, Niger), the Boko Haram in Nigeria and Cameroon; rebellions in Angola (1991–2002), Liberia (1999–2003), Côte d'Ivoire (2002–2010), Democratic Republic of Congo (since 2000). We do not include the variable democracy because we analyse the impact of democracy on SPI in the second part.

Another specificity of our SPI index is that the sample is constituted only by SSA countries (47).⁶ The SPI of Alesina and Perotti (1996), Gupta (1990), Venieris and Gupta (1986) and Hibbs (1973) cover the period of 1960–1985, our index is from 1990 to 2018. This difference of the period makes difficult the comparison of this SPI with our SPI. The two periods, 1960–1985 and 1990–2018 are very different in terms of political events in SSA. 1990 is an important date for democracy in SSA. During that period, most SSA countries after a lot of years of single-party and dictatorship adhered to political pluralism, multiparty politics, freedom of expression, and the state of law.

We start the PCA method with the matrix of correlations between the ten variables. The most correlated variables are NDEATH – REPRESS – NKILL; SCOUPI – ATCOUP2 – ASSASSEX. As some variables are highly correlated, we can apply the PCA method⁷ using less than ten components. Normalised PCA is used because all variables are not on the same scale. The case of the regime durability whose highest value is 37 and the number of persons killed which are thousands. Thus the variables are centred reduced.

After the normalisation of the variables, we determine the eigenvalues of the ten components. The components are new variables, linear combinations of the initial variables and not correlated with each other (they are orthogonal to each other; each has information that is not explained by the others).

⁵ The variables are: ASSASS (the number of politically motivated assassinations); DEATH (the number of people killed in conjunction with phenomena of mass domestic violence, as a fraction of the total population); SCOUPI (the number of successful coups); UCOUP (the number of attempted but unsuccessful coups); DEM (a dummy variable that takes the value of 1 in democracies, 0.5 in 'semi-democracies' and 0 in dictatorships).

⁶ The country list is in the annexe 1.

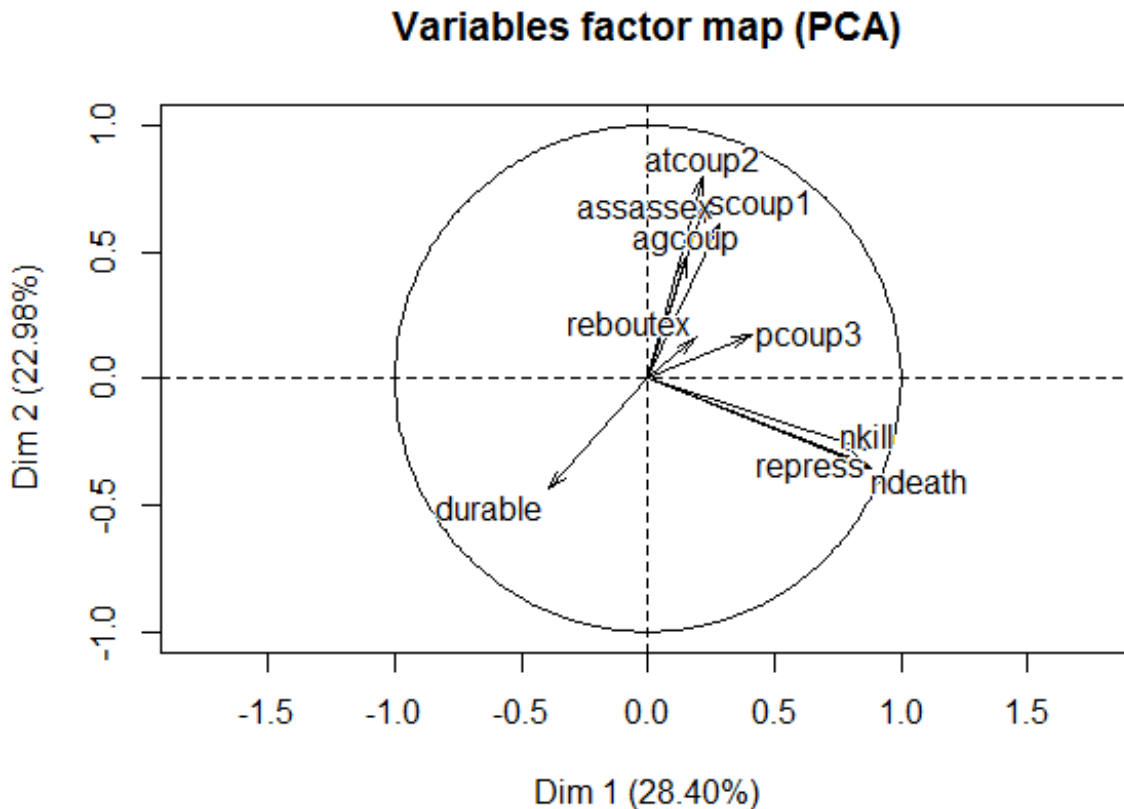
⁷ The other elements of the PCA method (the matrix of correlation, the coordinates of the variables, and the eigenvalues) are exposed in the annexe 2.

Table 2: Principal components (eigenvalues)

COMPONENT	EIGENVALUE	PROPORTION	CUMULATIVE
COMP1	2.840	0.284	0.284
COMP2	2.298	0.230	0.514
COMP3	1.469	0.147	0.661
COMP4	0.977	0.098	0.758
COMP5	0.781	0.078	0.836
COMP6	0.629	0.063	0.899
COMP7	0.411	0.041	0.940
COMP8	0.314	0.031	0.972
COMP9	0.197	0.020	0.991
COMP10	0.086	0.009	1.000

Based on the Kaiser (1960) criterion which recommends retaining those components with eigenvalues equal or higher than 1 (the variance of each standardised variable), we retain four components which explain 75.8% of the total inertia.

To interpret the new axes, we use the circle of correlations (between the variables and between each variable and the first two components) of the variables factor map. The variables are represented in a plane by the first two components.

Figure 1: Variables factor map (PCA)

Following the variables factor map (PCA), we can group the variables into three: DURABLE; NKILL–REPREE–NDEATH; REBOUTEX–PCOUP3–ATCOUP2–ASSASSEX–SCOUP1–AGCOUP.

When we take the first axis as reference (the horizontal axis), the variables NKILL, REPREE and NDEATH are orthogonal to the variable durable. The first axis opposes the killings to the regime durability in the SPI. The killings are not linked to the duration of a regime.

When we take the second axis as reference (the vertical axis), the variables REBOUTEX, PCOUP3, ATCOUP2, ASSASSEX, SCOUP1, and AGCOUP are opposed to the variable durable. The more coup d'état there is, the less the duration of a regime is. It means that the alternation in power in SSA takes place in several cases by coup d'état. There are two ways to change a regime in office: the change can appear according to the law or following a coup d'état.

1.3 PCA, hierarchical clustering and partitioning

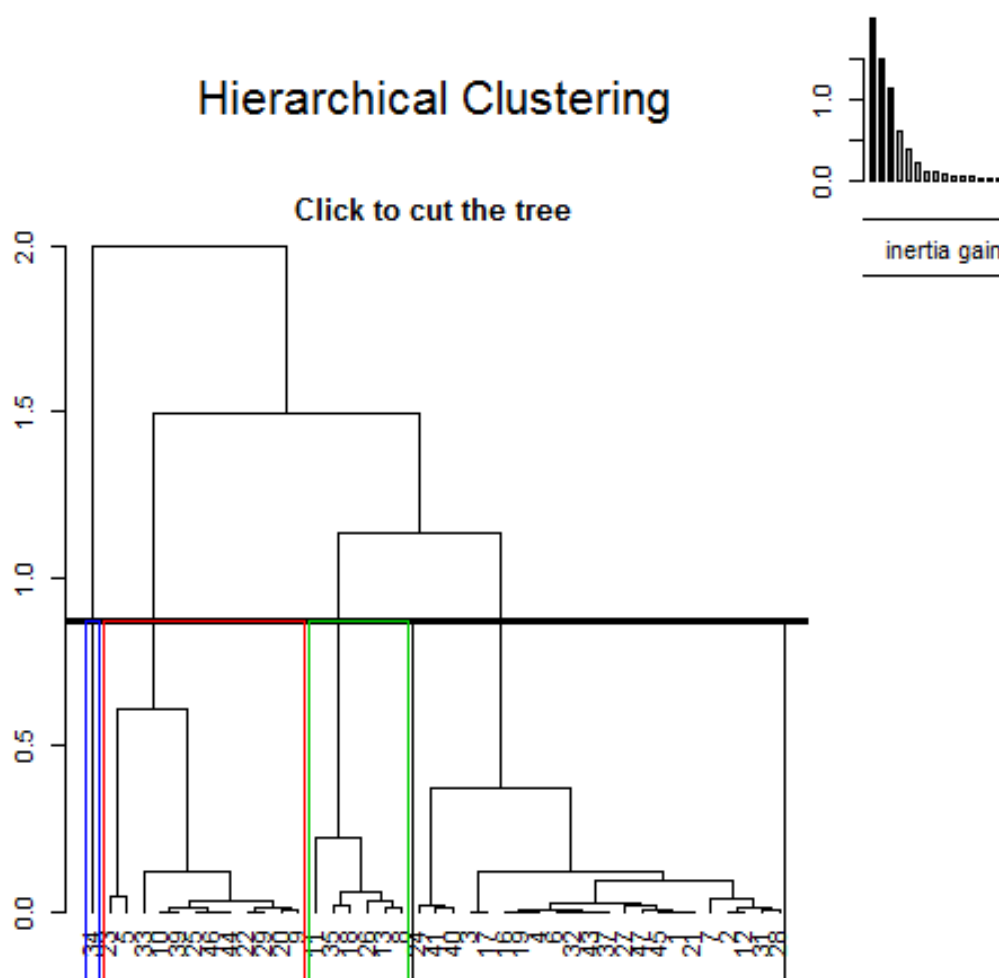
In addition to the PCA for the construction of the SPI index, we use two other methods which are: the Hierarchical clustering also called Ascending Hierarchical Clustering (AHC) and the Partitioning. These three standard methods⁸ put together constitute the Hierarchical Clustering on Principal Components (henceforth HCPC) approach. The objective of the HCPC is to study the similarities and differences between countries from a multidimensional point of view.

The ascending hierarchical clustering is represented graphically by a tree (diagram) called a dendrogram. The number of groups (four in our case) in the hierarchical clustering is the number of components of the PCA and the Ward criterion is used to build the dendrogram.

The third method is the K clusters partitioning. Partitioning is used to divide a dataset into several groups. A partition is good when individuals of the same class are closed and individuals of two different classes are distant. The number of communities determined by the PCA is also used to partition the countries in our sample into four subgroups.

This methodology adopted is available in the HCPC (Hierarchical Clustering on Principal Components), function of the FactoMineR package from R (<http://factominer.free.fr/>). We use R software.

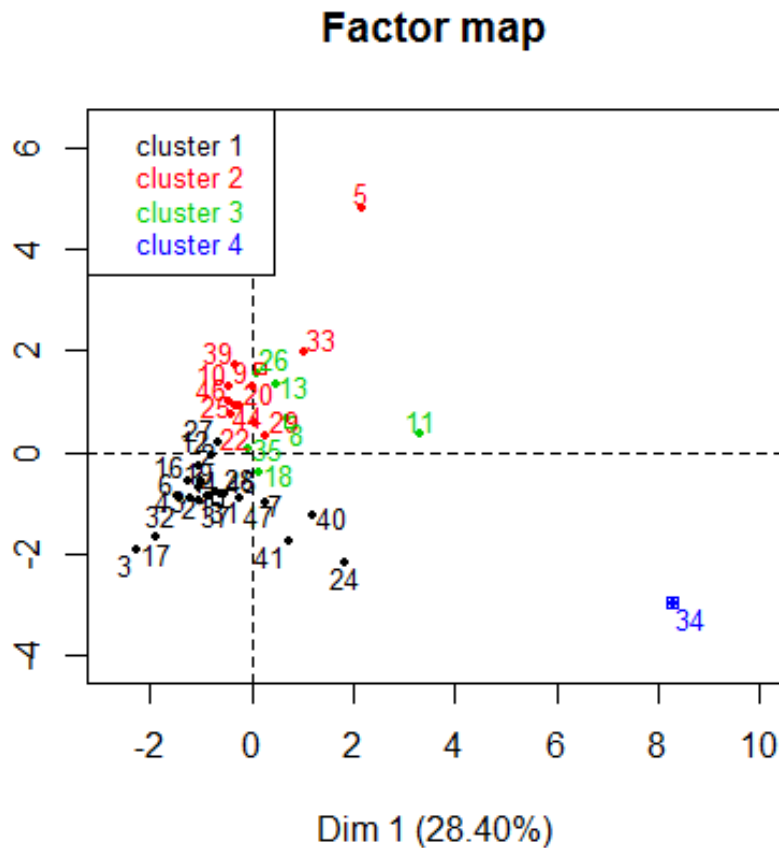
⁸ The three standard methods used in multivariate data analysis (Husson et al. 2010) are: a principal component method (ACP, AFC, ACM, AFDM, AFM), ascending hierarchical clustering and partitioning in k clusters.

Figure 2: Dendrogram showing the partition of countries (1990–2018)⁹**Table 3: Classification of the countries according to SPI (1990-2018)**

Group A (blue colour)	Group B (green colour)	Group C (red colour)	Group D (black colour)
34 Nigeria	8 Central A. Rep.	5 Burundi	1 Angola
	11 Congo, D. Rep.	9 Chad	2 Benin
	13 Côte d'Ivoire	10 Comoros	3 Botswana
	18 Ethiopia	20 Gambia, The	4 Burkina Faso
	26 Liberia	22 Guinea	6 Cabo Verde
	35 Rwanda	23 Guinea-Bissau	7 Cameroon
		25 Lesotho	12 Congo, Rep.
		29 Mali	16 Eritrea
		33 Niger	17 Eswatini
		39 Sierra Leone	19 Gabon
		44 Togo	21 Ghana
		46 Zambia	24 Kenya
			27 Madagascar
			28 Malawi
			31 Mozambique
			32 Namibia
			37 Senegal
			40 Somalia
			41 South Africa
			43 Tanzania
			45 Uganda
			47 Zimbabwe

SPI is similar within each group of countries, and differs from group to group. These within similarities and between differences are confirmed by the story of each country.

⁹ The countries which are not included in the different classes are those which do not have enough data (Djibouti, Equatorial Guinea, Mauritius, Sao Tome and Principe, Seychelles and Sudan). To allow a good representation of the graphs, we replace the names of the countries by numbers.

Figure 3 : Partitioning in K-clusters (1990-2018)

Using the first two principal components, the factor map represents the four clusters. A square represents the barycentre of each cluster, and the individuals are coloured according to their cluster.

After performing the clustering, we describe each cluster using three approaches: (1) We describe each cluster according to the variables in table 4; (2) We describe each cluster according to the principal components in table 5; (3) We also analyse the distance between each country and the centre of its cluster in table 6.

Table 4: Description of each cluster according to the variables

CLUSTER A			CLUSTER B		
VARIABLE	MEAN IN CATEGORY	OVERALL MEAN	VARIABLE	MEAN IN CATEGORY	OVERALL MEAN
NKILL	25250	1763.171	REBOUTEX	1.000	0.146
REPRESS	673	83.683	ASSASSEX	0.500	0.146
NDEATH	48360	4545.585			
PCOUP3	3	0.781			

CLUSTER C			CLUSTER D		
VARIABLE	MEAN IN CATEGORY	OVERALL MEAN	VARIABLE	MEAN IN CATEGORY	OVERALL MEAN
SCOUP1	1.333	0.512	DURABLE	350.591	283.415
ATCOUP2	3.750	1.610	ASSASSEX	0.000	0.146
PCOUP3	1.500	0.780	PCOUP3	0.409	0.780
AGCOUP	0.250	0.073	REBOUTEX	0.000	0.146
			ATCOUP2	0.318	1.610
			SCOUP1	0.045	0.512

Table 5: Description of each cluster according to the component

CLUSTER A			CLUSTER B		
Component	Mean in category	Overall mean	Component	Mean in category	Overall mean
1	8.290	5.263E-17	3	-2.309	-2.105E-16

CLUSTER C			CLUSTER D		
Component	Mean in category	Overall mean	Component	Mean in category	Overall mean
2	1.648	-3.808E-16	1	-0.670	5.263E-17
3	0.950	-2.105E-16	2	-0.926	-3.808E-16

Table 6: Description of each cluster according to the distance between countries in the same cluster

CLUSTER A		CLUSTER B				
Cluster: A		Cluster: B				
34		8	35	26	13	18
0		0.407	1.119	1.271	1.311	1.353

CLUSTER C					CLUSTER D				
Cluster: C					Cluster: D				
9	39	10	25	46	1	45	31	37	21
0.434	0.554	0.851	0.881	0.941	0.331	0.355	0.403	0.435	0.461

According to table 5, the four clusters are represented by different components; two clusters chosen randomly have not the same principal components. It means that the clustering has been done well: countries have been grouped according to their similarities (intragroup) and according to their differences (intergroup).

We interpret the three tables, table 4, 5, and 6, considering the clusters.

Cluster A: The country from cluster A (Nigeria) has a high SPI since the averages of the variables (NKILL, REPRESS, NDEATH, PCOUP3) of this cluster is much higher than the average for all the countries. It means that a lot of killings characterises the SPI of Nigeria. More than 10,000 deaths during the religious conflict in the 1990s. More than 1,500 deaths during community conflict (Ijaw, Itsekeri). Another religious conflict in 2000 with more than 55,000 deaths. The Boko Haram has killed more than 1 million people in Nigeria. Nigeria is represented only by the component 1. The characteristic of component 1 is the killings.

Cluster B: The countries from cluster B have a high SPI since the averages of the clusters' variables (REBOUTEX, ASSASSEX) is much higher than the average for all the countries. It means that the SPI of cluster B is characterised by rebellion and assassination of the executive. Considering the distance from the barycentre, the countries which characterise the Cluster B are Central African Republic (rebellion from 2004 to 2013), Rwanda (rebellion from 1990 to 1994; the assassination of the president Juvénal Habyarimana in 1994), Liberia (assassination of the president Samuel Kanyon Doe in 1990), Côte d'Ivoire (rebellion in 2002) and Ethiopia (the ONLF rebellion since 1984). Component 3 is characterised by rebellion and coup d'état (successful or not). The countries of cluster B have their coordinates in component 3 only.

The countries from cluster D are characterised by below-average SPI since the variables (DURABLE, ASSASSEX, PCOUP3, REBOUTEX, ATCOUP2, SCOUP1) of this cluster are smaller than the average for all the countries. A regime's duration and coup d'état (successful or not) characterise the SPI of cluster D. The countries which characterise the cluster D are Angola (38 years of José Eduardo dos Santos in power), Uganda (Yoweri Museveni with 35 years in office), Mozambique (Joaquim Chissano with 19 years in office), Senegal (Abdou Diouf with 17 years in office), Ghana (20 years of Jerry Rawlings in power). The countries of the cluster D are represented by the components 1 and 2. The component 2 is characterised by the regime's duration.

Cluster C: The countries from cluster C have a high SPI since the averages of the variables of the cluster (SCOUP1, ATCOUP2, PCOUP3, AGCOUP) is much higher than the average for all the countries. This means that the SPI of cluster C is characterised by coup d'état (successful or not). The countries which characterise the cluster C are Chad (coup d'état in 1990, 2004, 2006), Sierra Leone (coup d'état in 1992), Comoros (coup d'état in 1995, 1999), Lesotho (coup d'état in 2014) and Zambia (coup d'état in 1997). The countries of the cluster C are represented by the components 2 and 3.

All these results are confirmed by each country's position on the factor map and the position of the variables on the variables factor map.

2) Measuring income inequality

The measure of inequality has been at the centre of several debates among economists from Smith A. to Atkinson A. passing by Sen A.

2.1 Consumption or income; disparity or dispersion?

Dispersion measures measure intra (within) inequalities, that is, inequalities within the same group, generation or category. It is measured with deviations from the mean (variance, standard deviation and coefficient of variation), the median, the extent. Dispersion is also measured by the ratio of quantiles: interdecile ($D9 / D1$), interquartile ratios ($Q3 / Q1$) ... Dispersion measurements often give a truncated picture of inequalities. When there are several samples, the inequality measure can vary from one sample to another.

With the measures of disparity, inter (between) inequalities, it is possible to make comparisons between different groups, different generations, different categories. Disparity is measured by the comparison of ratios or percentages of groups. Interpreting disparity indicators poses many difficulties. In addition to the fact that the disparities do not reflect heterogeneity within the reference categories, the comparison of indicators can be misleading because it can lead to the comparison of inequalities that are not the same nature.

What is the best variable between consumption and income to measure inequality in SSA?

Some authors argue that using consumption alone to the detriment of income to measure inequality could lead to unreliable results for several reasons. The data on high consumption may be underestimated because the marginal propensity to consume decreases with high wealth levels. Furthermore, consumption data may be biased downward because the consumption basket does not often include items consumed by the wealthy (Milanovic, 2006). It is for these different reasons that these authors prefer income as a variable to measure inequality.

Hence, for some economists, including those of the World Bank's Center for Development Data (C4D2), consumption is the best variable to be used in measuring inequality. Measuring consumption has lot of advantages. Exact: a good approximation of actual consumption. Precise: reflects as closely as possible the differences within the sub-populations. Consistent: able to monitor well-being over time or compare results in different contexts. Consumption is easier to measure than income (Deaton and Zaidi, 2002) because income undergoes several seasonal variations in low-income countries where the informal sector is important. Consumption tends to be naturally constant (Tarozzi, 2007). In practice, economists prefer to combine different data (on income, consumption and wealth) to measure income inequality.

To overcome the different limits of these elementary indices of inequality, economists refer to synthetic indices of inequality. The most common in the economic literature are the Gini index, Theil index and Atkinson index. Each of these indices has advantages as well as limitations. An analysis of these different indices allows us to justify our choice of the Gini index.

2.2 Gini index

The Gini index (Gini, 1921) is the most frequently used index to measure income inequality. It quantifies the difference in the distribution of income (in some cases consumption expenditure) between individuals or households and a perfectly equal distribution.

The Gini index varies from 0 to 1 and the higher it is, greater is the inequality. It has several advantages but also limitations.

The Gini index makes it possible to analyse the impact of the distribution because its sensitivity to transfers, taxes and subsidies. The reliability of the coefficient is not affected by the number of individuals in the population. However, the Gini coefficient gives no indication of the distribution of income and the level of income. Thus, it is possible for two countries to have the same Gini coefficient for different wealth distribution. It says nothing about what drives inequality. The Gini coefficient is not always perfectly additively decomposable, it tends to be more sensitive to transfers near the middle (the mode) of the distribution than to the tails.

To overcome the limits of the Gini index, we often rely on the "Lorenz curve" which allows to graphically estimate the Gini index.

The Lorenz (1905) curve is a graphical representation allowing to visualize the distribution of total income (gross income, salary, disposable income,...) within a population. It is the most popular graphical analysis tool for viewing and comparing inequalities. The outcome it provides on inequality is much more complete than traditional measures of disparity or dispersion because it relates population and income. The Lorenz curve consists of relating the different cumulative populations to the proportion of the income they hold respectively. The Lorenz curve gives an idea of the state of inequality within this population. It is the Gini coefficient (G) which calculates the inequality based on the Lorenz curve. The Gini index is the area between the Lorenz curve and the even line. However it is possible for two different Lorenz curves to give rise to the same Gini coefficient.

2.3 Entropy measures

This class of inequality indices is based on the concept of entropy which is a measure of disorder in thermodynamics. Applied to income inequality, it means the deviation from perfect equality.

The measures of the generalized entropy class are measures of inequality which satisfy the six properties of a good measure of inequality. These properties are: independence of the mean, independence of the population level, symmetry, sensitivity to Pigou-Dalton transfers, decomposable and statistically testable. Among all these properties, the most important characteristic of this index is its decomposability.

Equation (1.2) is the generalized entropy equation GE_α

$$\begin{cases} GE_\alpha = \left(\frac{1}{N} \sum_{k=1}^N \left(\frac{y_k}{\bar{y}} \right)^\alpha - 1 \right) \frac{1}{\alpha(\alpha - 1)} & \alpha \neq 0 \quad \text{et} \quad \alpha \neq 1 \\ GE_{\alpha=0} = \frac{1}{N} \sum_{k=1}^N \log \left(\frac{\bar{y}}{y_k} \right) \\ GE_{\alpha=1} = \frac{1}{N} \sum_{k=1}^N \frac{y_k}{\bar{y}} \log \frac{y_k}{\bar{y}} \end{cases} \quad (1.2)$$

y_k : the income of individual k belonging to a population of N individuals. \bar{y} represents the average income and α is a parameter. The GE varies between 0 (represents an equal distribution) and infinity (a high level of inequality).

The parameter α represents the weight given to the distances between incomes at different levels in the distribution. The lower it is, the more sensitive the inequality indicator in the lower region of the distribution is, and vice versa. This parameter can be used to assign a weight to the distances between incomes in different places in the distribution.

The most commonly used values of α are -1, 0, 1 and 2. For $\alpha = 0$, greater weight is assigned to the distances between incomes at the bottom of the distribution, the indicator therefore becomes more sensitive to changes at the bottom of the distribution. In this case, expression (1.2) becomes the Mean Log Deviation (MLD)¹⁰:

$$GE_{\alpha=0} = \text{MLD} = \frac{1}{N} \sum_{k=1}^N \log \left(\frac{\bar{y}}{y_k} \right) \quad (1.3. a)$$

When the indicator takes the value 0.5, this indicates that 74% of individuals have 26% of resources, while 26% of individuals have 74%. For $\alpha = 2$, the indicator gives proportionally more weight to the distances between incomes from the top of the distribution.

¹⁰ MLD is also called Theil's second measure.

Theil's index (1967)

Theil's index is a special case of generalized entropy ratios (Mussard et al. 2003). It corresponds to the generalized entropy index for $\alpha = 1$.

$$T = GE_{\alpha=1} = \frac{1}{N} \sum_{n=1}^N \frac{x_n}{\mu} \log \frac{x_n}{\mu} \quad (1.3. b)$$

Theil's index measures the difference between the egalitarian distribution and the observed distribution. Thus, if Theil's index is zero, then the distribution is perfectly egalitarian. Conversely, the more the income is dispersed, the higher it will be. It is equal to $\log n$, in the case where a single individual concentrates all of the income.

When the Theil's index is 1, it indicates an inequality represented by a society where 82.4% of individuals made up of the poor have 17.6% of resources and 17.6% of people made up of the rich have 82.4% of resources.

Since Theil's index is a general entropy index, it has the property of decomposability. This decomposition makes it possible to calculate the "within" inequality and the "between" inequality.

Atkinson indicator

The Atkinson indicator represents the loss of income that individuals would be willing to accept for the distribution of income to be egalitarian.

An indicator of $x\%$ indicates that the population would agree to cede $x\%$ of its resources in exchange for an egalitarian distribution.

The generalized form of the Atkinson index (1970) is:

$$A_\varepsilon = 1 - \left[\frac{1}{N} \sum_{k=1}^n \left(\frac{y_k}{\bar{y}} \right)^{1-\varepsilon} \right]^{\frac{1}{1-\varepsilon}} \quad \text{pour } \varepsilon \neq 1 \quad \text{et} \quad A_\varepsilon = 1 - \prod_{k=1}^n \left(\frac{y_k}{\bar{y}} \right)^{\frac{1}{n}} \quad \text{pour } \varepsilon = 1 \quad (1.4)$$

The parameter ε represents the more or less strong aversion for inequality. The more this parameter decreases, the less considered is the transfers to individuals with low income. However, the higher ε is, the more society is sensitive to inequality.

Atkinson (1970) is one of the pioneers to argue that the measurement of inequality depends on the opinion of the society on distributive justice. The measurement of inequalities must therefore be based on an analysis of distributive justice. As such, the use of simple statistical dispersion indices cannot be satisfactory. It is this opinion that he materializes by the parameter ε : the degree of aversion to inequality.

2.4 Income inequality measure

The problem of income inequality data in SSA is the scarcity of available data, the absence of administrative data and most of data is based on survey estimates. Household surveys routinely underestimate the income and wealth of individuals at the top of the social ladder.

There are lot of initiative to build an accurately income inequality database for SSA countries. The most used in the economic literature are: the World Inequality Indicators Database (WIID) of the United Nations University World Institute for Development Economics Research (UNU-WIDER); The Standardized World Income Inequality Database (SWIID); The Luxembourg Income Study Database (LIS); The World Inequality Database (WID) of the World Inequality Report; and the World Development Indicators (WDI) of World Bank.

One of the last research on the measure of income inequality is the World Inequality Database (wid.world/). In tackling the issue of household surveys, Alvaredo et al. (2018) used an adequate methodology by combining different data sources (national accounts, survey data, fiscal data, and wealth rankings) and distributing the totality of global income to the totality of the population. The problem of this World Inequality Database is that only 17/47 of SSA countries¹¹ are in the Database. Another income inequality database is the Gini coefficient of World Development Indicator (WDI) of World Bank. The World Bank staff have made an effort to ensure that the data are as comparable as possible. Wherever possible, consumption has been used rather than income.

We adopt the Gini coefficient of the World Income Inequality Database (WIID) version 4 to measure income inequality of our model for several raisons. Data are obtained from the main available current databases: World Bank, the Luxembourg Income Study (LIS) and the PovcalNet (World Bank), as well as from national statistical offices and from a large range of independent research papers.

The majority of the country of our sample, 47 countries of SSA, is present in the database. UNU-WIDER has constructed this dataset out of several different datasets. In many cases UNU-WIDER has recalculated the Gini index so that it is better comparable. However, it is very hard to compare Gini indexes across countries and different dataset.

Acemoglu et al. (2015) and Odusola (2017) use the data of the Standardized World Inequality Indicators Database (SWIID), constructed by Solt (2009). They use the SWIID because it provides both the net Gini, after taxes and transfers, and the gross Gini coefficients.

¹¹ Burkina Faso, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Malawi, Mali, Mauritius, Niger, Nigeria, Rwanda, South Africa, Seychelles, Tanzania, Uganda, Zambia and Zimbabwe.

3 Bilateral relationship between income inequality and SPI

The relationship between income inequality and SPI has been addressed in the economic literature. Some authors have proven the existence of a bilateral relationship between SPI and inequality; others have linked income inequality - SPI to political systems (democratic-dictatorial, capitalist-socialist-communist, presidential-parliamentary).

3.1 Income inequality and SPI

The relationship between income inequality and SPI is bidirectional. The literature believes that SPI is caused by inequality. Dutt and Devashish (2008) argue that most countries in SSA have significant natural resources, but too often the income from these resources is diverted by powerful elites who are in power.

In events of large inequalities, election results are unreliable due to the influence of the wealthy and lobbies (Krugman, 2007). Kaufmann et al. (1999), using the Worldwide Governance Indicators, find that, as a general rule, unequal societies are much more prone to political instability, they are subjected to violence, coups d'Etat ...

Like Alesina and Perotti (1996), Dutt and Devashish (2008) conclude that inequality is positively correlated with political instability. They find significant and robust results.

Reducing inequalities is very beneficial for the economy, for social cohesion and peace. There are many authors defending this thesis (Dabla-Norris et al., 2015; Persson and Tabellini, 2000; Véneries and Gupta, 1986...).

SPI is also caused by inequality. Several studies show that there is a difference in the allocation of resources between favourable and unfavourable areas to the ruling party (Lindbeck and Weibull 1987; Dixit and Londregan 1996, 1998; Bardhan and Mookherjee 2010). This is the case in India where, after the elections, partisan districts received transfers that are more than 16% than those of non-partisan districts (Arulampalam et al, 2010).

There is a positive relationship between inequality and political instability (Muller and Seligson, 1987; Alesina and Perotti, 1996). Alesina and Perotti (1996, page 1204) argue that "Income inequality, by fuelling social discontent, increases SPI. The latter, by creating uncertainty in the politico-economic environment (coups, revolutions, mass violence... threatening property rights), reduces investment ... and growth." Thus inequality and investment with economic growth are inversely linked. For Alesina and Perotti (1996), the SPI is the channel through which inequality negatively affects investment and economic growth.

The SPI evolved during a recession and economic instability. Gasiorowski (1995) and Przeworski et al. (1996) show that recessions significantly increase coups. This was the case for Brazil in 1964, Chile in 1973 and Argentina in 1976 to mention a few. On the other hand, the rich countries (Norway, Iceland, Sweden ...) succeed in consolidating their democracy thanks to the stability of their economy. These authors point out that SSA countries, which are poor countries, have SPI because of economic instability.

For Bourguignon and Morrisson (1998), levels of violence, as measured by homicide rates, increase sharply in the two most unequal regions of the world (Latin America and SSA), and less in regions where growth is the fastest (Eastern Europe, Russia and Central Asia).

Addressing the issues of instability and its consequences for economic development, Collier (2007) shows that 73% of the poorest countries have recently experienced a civil war. According to this study, the causality between poverty and political instability is a two-way street. Londregan and Poole (1990, 1991) argue that there is a positive correlation between political instability and poverty: poor countries are unstable because they fail to get rich because they are politically unstable.

3.2 Income inequality - SPI and the political system

Economists have long sought to resolve the issue of inequality by proposing political systems. These political systems are: dictatorship, democracy, the parliamentary system, the presidential system, socialism, communism....

More (1516), Fourier (1827), Saint-Simon (1820) and the Saints Simonians, and Proudhon (1846)... proposed socialism as a solution to the high inequality created by the capitalism. Unlike Marx (1848), who believes that inequality will force capitalism to disappear to make way for socialism and then communism, other authors (Tocqueville for example) believe that all political systems (socialism, communism, dictatorship, the feudalism, authoritarianism, totalitarianism, monarchy ...) will end up being democratic because of the inequalities and deprivation of liberties in these systems.

The fall of communism and the equalization of conditions proved Tocqueville is right; He considers that there is a natural inequality in any society, even a democratic one. This inequality stems from the inequality of intelligence and economic equality is impossible. What democracy guarantees is the equality of conditions (equality of rights, opportunities and social relations) and individual freedom.

Acemoglu and Robinson (2001) note that extreme inequality is not conducive to the establishment of democratic institutions. Extreme inequality leads to fights between rich and poor people to control the power. So we can't have democracy in presence of extreme inequality.

In countries where democracies are consolidated, such as the OECD countries, there is no fear of coups. These countries show much more stability. Democracy is seen as a remedy for political crises. Democracy favours economic development. The richest countries in the world are democratic countries. It is the case of the Northern European countries, New Zealand, Canada, Australia and the United States of America.

Other authors believe that the establishment of democracy in a country needs a number of prerequisites to be settled. Before the adoption of democracy, the country must reach a certain level of development. The country must have certain achievements: an acceptable per capita income, a low level of poverty, a high level of education, information and communication technology ... Ultimately, these authors propose monarchy and / or dictatorship for poor countries. Once the period of poverty has passed, these countries will be able to apply democracy. Democracy is the system of countries with a minimum of development.

The democratic system is also criticized by some authors. Buchanan and Tullock (1962) criticize this system for several reasons. The tyranny of the majority: a majority coalition can exploit minority groups; Reduction in well-being: the tax levy reduces incentives to work, to save, and therefore reduces growth; the majority system does not take into account the preferences of individuals and leads to a distribution for the benefit of the ruling minorities.

Some researchers cite the countries of Asia Minor and the countries north of Africa as an example. These countries have applied political systems different from democracy (monarchy, dictatorship). Thanks to these systems, these countries have maintained political and social stability.

The risk is high in the presidential system, there are more frequent coups. The reason put forward by Lipset (1993) is that in the presidential system, the symbol of authority and effective power are exercised by one person, while in the parliamentary system, the executive power is distributed among the members of parliament who represent different groups or parties. That's why Madison (1788) proposed the inclusion of the separation of powers in the constitution.

The presidential system is criticized because once elected, the president reigns without power sharing. Proportional voting could help calm the political struggle and reduce electoral tensions.¹² The Lesotho case illustrates how proportional representation has promoted more inclusive political games and reduced the risk of conflict during elections. The presidential system leads to more SPI than the parliamentary system (Przeworski et al., 1996).

Many parliamentary systems have failed to produce stable governments because they lack legislative majorities. For example, out of the seven Eastern European countries moving away from communism, only one, Albania, was able to obtain a legislative majority.

In France, the failure of multiparty parliamentary systems in 1958 leads Charles de Gaulle to move to a presidential regime which leads to more effective and long-term governments.

In terms of the concentration of power, a prime minister with a parliamentary majority is much more powerful and has fewer constraints than a president in a presidential regime who has to face parliament (Lijphart 1984, page 4-20). This usually occurs in most Commonwealth nations and in some European countries.

Some Asian countries (South Korea, Taiwan, Singapore, Indonesia, Malaysia, Vietnam, China, etc.) managed to maintain a relatively low level of inequality while an autocratic regime was in place within them. These non-democratic (autocratic) regimes have not prevented them from having high economic growth rates, increasing exports and favouring direct investment abroad.

This is the case of the automobile sector where half a dozen Asian countries make as many vehicles as factories in North America and the EU. The latter are democratic.

There is no consensus among scientists on the best system (presidential or parliamentary) because it is possible to cite many advantages as well as failures for both.

It clearly appears that the question of the best political system (dictatorship, autocratic regime, democracy, parliamentary regime, presidential regime, monarchy), which makes possible to avoid income inequality and SPI as much as possible has always been at the centre of economic debates. Which institution do SSA countries need and what is the best approach to apply these institutions to reduce income inequality and SPI?

¹² Reynolds and Carey (2012).

4) Polarisation - Fractionalization

Economists have analysed fractionalization and polarization as a cause of instability theoretically and empirically.

One of the well-known theoretical model is Esteban and Ray (1999). They develop a behavioural model that links the level and pattern of social conflict to the society wide distribution of individual characteristics. Another important research is Esteban and Ray (2008) which provides a theoretical framework that permits to distinguish between the occurrence of conflict and its severity and which clarifies the role of polarization and fractionalization in each of these cases. They discovered that in highly polarized societies, the occurrence of open conflict should be rare but its intensity very severe, whenever it happens. And highly fractionalized societies are prone to the occurrence of conflict, but its intensity will be moderate.

Lots of empirical researches have been carried out to analyse the impact of fractionalization, polarization and dominance on instability.

Esteban and Schneider (2008) make a large literature review on the issue. They find that recent formal and empirical research in political science and economics strongly indicates that various forms of political and social polarization increase the risk of violent conflict within and between nation states. Ellingsen (2000) establishes that the relationship between the number of groups and conflict is curvilinear. Collier and Hoeffler (2004) show that the dominance of one large group, rather than fractionalization, increases the probability of civil war (Horowitz, 1985). In their view, this is due to the fact that fractionalization reduces the possibility of marginal groups organizing themselves effectively. Schneider and Wiesehomeier (2006) obtain that fractionalization is a better predictor of low-level conflict than polarization. Esteban and Ray (1999) show that the level of conflict increases with the magnitude of polarization. If there are two groups, the intensity of conflict is most pronounced.

The economists have also measured the fractionalization, polarization. For Esteban and Schneider (2008), the measure of fractionalization can be understood as the probability that two randomly chosen individuals happen to belong to different groups.

$$\text{The index of fractionalization } F = \sum_i n_i(1 - n_i) = 1 - \sum_i n_i^2 \quad (1.5)$$

Where n_i is the probability that an individual of group i is chosen.

$$\text{The index of polarization } P(\sigma, b) = \sum_i \sum_{j \neq i} n_i^{1+\sigma} n_j b_{ij} \quad (1.6)$$

Where b is the matrix of intergroup distances and σ is a positive parameter that captures the extent of group identification (Esteban and Ray, 1994).

The measures of fractionalization and polarization tend to run in opposite directions (Esteban and Ray, 2008). A larger number of group increases fractionalization and decreases polarization, and vice versa.

Another concept is the dominance that Collier (2001) introduced. It qualifies societies as 'dominated' if the largest group contains between 45% and 90% of the overall population. When one group is dominant, the other groups lack the capacity for mobilization, and the dominant group is likely to possess a strong position in the state and to have few incentives to attempt changing the status quo. One of the consequence of income inequality is the polarisation. Polarisation is also a cause of instability. Østby (2008) uses data from the Demographic and Health Surveys (DHS) for 36 developing countries for her empirical tests and shows that horizontal social inequality is positively related to conflict outbreak.

II) METHODOLOGY APPROACH

We present in this section the model we estimate. The model is inspired by Alesina and Perotti (1996).

1) Model

In models where SPI is used, two equations are used to make the estimates. In the first equation, the SPI is estimated (through a probit regression or the PCA method) and in the second equation, we regress the SPI with an economic variable (income, GDP per capita, GDP growth and investment).¹³

In our research, we use this methodology, which estimates two equations. In the theoretical framework of this chapter, we have carried out the measurement of SPI. The equation (1.1) therefore constitutes the first equation. For the second equation, we use the model of Alesina and Perotti (1996). In this second equation (Equation 1.7), the SPI, the dependent variable, is explained by income inequality, the level of democracy and a set of control variables constituted by institutional and economic variables (Ethnic fractionalization, Education, GDP, Growth, Inflation, Natural Resources, Urbanisation).

Weak institutions are fertile ground for SPI. It increases the likelihood of political unrest and encourages citizens to resort to violence rather than focusing on economic and socially profitable activities. Zelao (2000) in his argument on the question reveals that the moods and rebellions in Africa most often come from the weakness in the political institutions. The most stable countries are those which have the most reliable and solid institutions capable of effectively managing conflicts between antagonistic groups. Countries with strong institutions experience fewer wars and genocide, extreme forms of racial violence are less likely. It has been noted that in the countries where genocides have taken place (Rwanda, Guatemala, Indonesia, etc.) the quality of their institutions is poor. To take into account the quality of the institutions in our regression, we insert the following variables: Democracy and education.

We expect SPI decreases with economic development (Hegre and Sambanis, 2006). Wealthier countries have more resources at their disposition that could be invested in social insurance and other forms of redistribution with the aim of alleviating social tensions. In highly developed countries, the tax base is also broader than in developing economies (Collier and Hoeffler, 2004). Economic development will be measured through the GDP per capita (Schneider and Wiesehomeier, 2008).

¹³ Hibbs (1973), Fosu (1992) and Alesina and Perotti (1996); Venieris and Gupta (1986) ; Gupta (1990) ; Barro (1991) ; Ozler and Tabellini (1991) ; Benhabib and Spiegel (1992) ; Mauro (1993).

To test the effect of social and ethnic divisions within our sample, we calculate ethnic fractionalization. We follow the methodology of Schneider and Wiesehomeier (2008 page 191-192). The fractionalization index is ranged from 0 to 1.

The model is as follows:

$$SPI_{it} = \alpha_1 y_{it-1} + \alpha_2 d_{it} + Z'_{it} \gamma + \theta_{it} \quad (1.7)$$

Table 7: Variables of the equation (1.7)

	DESCRIPTION	ORIGIN
SPI	Socio Political Instability	Calculated by us
y_{it}	Income inequality	Gini
d_{it}	Democracy	Freedom house et Bollen (2001)
Z		
Growth	GDP growth	WDI
Inflation	Inflation	WDI
N_resources	Total natural resources rents (% of GDP)	WDI
Urbanisation	Urban population (% of total population)	WDI
Education	Educational attainment, at least completed lower secondary, population 25+, total (%) (cumulative)	WDI
Fractionalization	Ethnic fractionalization	Fearon (2003)

In models where an economic variable explains a politic variable, there is the risk of joint endogeneity because of the bilateral relationship between the two variables. In our case inequality causes SPI, and SPI is also responsible for SPI. This bilateral relationship creates a problem of endogeneity. To overcome the problem of endogeneity, Londregan and Poole (1990, 1991), and Alesina et al. (1996) estimate a system of two equations in which the two endogenous variables are investment/economic growth and the SPI. To resolve joint endogeneity, we take the lagged of the income inequality that measures this variable at the beginning of the sample period.

Democracy

Although a consensus on the definition and measurement of democracy is hard to reach, most researchers agree on some fundamental characteristics of democracy. The government based on the majority and the consent of the governed, the existence of free and fair elections, the protection of minorities and respect for basic human rights. Etymologically, the word democracy has its origins in the Greek language. It combines two shorter words: "demos" meaning whole citizen living within a particular city-state and "kratos" meaning power or rule. So democracy means the rule by the people.

There are several measures of democracy for SSA countries. The most commonly used are the indices of the Polity IV¹⁴ and of Freedom House¹⁵.

Bollen (1990) calls attention to the problems that surround both the definition and measurement of democracy. For him there are four limitations to the measurement of democracy: invalid indicators, subjective indicators, ordinal or dichotomous measures, and the failure to test reliability or validity. The Center for Systemic Peace and Societal-Systems Research embarked on a major effort to upgrade the Polity Project and data series to better serve researchers. The project is established by Ted Robert Gurr in the 1970s. Initially, the aim of the project was to measure political system durability. Today the project is aimed at measuring the degree of democracy and autocracy (Marshall, Gurr and Jaggers, 2017). Polity IV based the measure of democracy on: (1) the competitiveness of political participation; (2) the regulation of political participation; (3) the openness and competitiveness of executive recruitment; and (4) constraints on the chief executive. The score of The Polity IV is a number between -10 and 10, with -10 indicating a full autocracy and 10 a full democracy. The Polity IV dataset covers all major, independent states in the global system (currently 167 countries) over the period 1800-2017.

The Polity IV database is criticized for the omission of out important elements, such as political and civil rights (at the core of the Freedom House measure), accountability (horizontal and vertical), rule of law, and political effectiveness.

We choose Freedom House Democracy Index to measure the democracy of our sample because its characteristics are necessary for our research. Freedom House's measure of democracy is based on political rights and civil liberties and contains the measure of electoral democracy. Civil liberties and political rights are two properties which are very important for democracy in SSA countries. That's why we refer to Freedom House measures to measure democracy in SSA countries. For Freedom House, a democratic country implies that the country enjoys a wide range of political rights and civil liberties.

The political rights are based on the electoral process; the political pluralism, the participation and the functioning of government. The indicators which composed the civil liberties are grouped into four categories: the freedom of expression and belief; the associational and organizational rights; the rule of law; and the personal autonomy and individual rights. So for Freedom House elections are regular, free and fair in a democratic country. The elected candidates govern, the political parties are competitive. The opposition plays an important role and enjoys real power. It is also possible

¹⁴ <https://www.systemicpeace.org/polity/polity4.htm>

¹⁵ <https://freedomhouse.org/report-types/freedom-world>

that the governance change after the elections. There are rights of expression, rights to organize and free press. Minority groups are not marginalized.

Political Rights and Civil Liberties are measured on a one-to-seven scale, with one representing the highest degree of Freedom and seven the lowest. Freedom in the World 2019 assigns the designation of "electoral democracy" to countries that have met certain minimum standards for political rights and civil liberties.

We calculate the mean of Freedom House's political rights and civil liberties indices and we take the difference of the percentage to 100 to obtain the Democracy Index. The higher the index is, the more democratic the country is, and vice versa. The index is available for all countries of our sample and from 1978 to 2018 and it is annual.

Freedom House publications are derived from the work of Gastil (1991) and co-workers. Freedom House's survey methodology is based on standards that apply to all countries and territories, regardless of geographic location, ethnic or religious composition, or level of economic development. It makes comparisons across countries possible.

2) Estimation of equation (1.7) by OLS

After presenting the model, we proceed to econometric estimates.¹⁶

Table 8: Summary statistics of the equation (1.7)

Variable	Mean	Std. Dev.	Nb. obs.
Socio Political Instability (SPI)	3.46E-08	1	485
Income inequality (Gini)	47.32	10.36	206
Democracy	36.83	23.56	1.36
GDP growth	4.28	7.34	1.28
Inflation	49.25	738.23	1.13
N_resources	11.67	11.53	1.26
Urbanisation	37.76	16.66	1.36
Education	31.96	23.53	73
Fractionalization	0.71	0.19	1.22

¹⁶ The statistics and econometrics tests of the variables and the model are presented in the annexe 3.

Table 9: Estimation by OLS of the equation (1.7)

	(A)	(B)	(C)
Income inequality	0.02*** (0.33)	0.02*** (0.00)	-0.07*** (0.37)
Democracy	0.68** (0.01)	0.44** (0.04)	3.31*** (0.07)
Growth		-0.06 (0.28)	0.06** (0.47)
Inflation		-0.01* (0.09)	-0.01 (0.11)
N_Resources			-0.3E-08 (0.15)
Urbanisation			-0.03** (0.33)
Education			-0.09*** (0.31)
Fractionalisation			0.63 (0.43)
Observations	74	74	70

Robust standard errors are in parentheses.

***: significant at 1%; **: significant at 5%; *: significant at 10%.

In the first estimate, i.e. estimate (A), we take the variables of income inequality and democracy to explain the dependent variable SPI. Then, we add the control variables in the regression gradually through the estimates (B) and (C). This allows us to perceive the effect of the different variables on SPI.

The estimate (A)

The positive sign of the coefficient of income inequality is that expected, the variable income inequality is significant: 0.02 (0.00). Income inequality has a positive and significant impact on SPI. In the 47 countries that make up our sample, inequality is one of the causes of instability. This result is the same as the authors find on the same subject (Acemoglu and Robinson 2001). It can nevertheless be noted that the impact of inequality on SPI, although significant, is small (0.02). According to this result, the cause of the SPI cannot be fully attributed to income inequality. In addition to inequality, other factors responsible for SPI should be looked for. This result confirms our first hypothesis: income inequality has a positive and significant impact on SPI.

Democracy is significant and the coefficient is positive: 0.68. This result we obtain indicates that in SSA countries, democracy is also responsible for SPI. The coefficient for inequality is 0.02 while the coefficient for democracy is 0.68. Democracy causes SPI 34 times more than income inequality ($0.68 / 0.02 = 34$). It could be argued that SPI is largely caused by democracy, the share of income inequality being low. Democracy in its conception promotes elections without violence, so theoretically, this coefficient should be negative. Nevertheless, several studies¹⁷ lead to the result we obtained: democracy is also at the origin of SPI in SSA.

This positive coefficient of the democracy variable could be explained in several ways. SSA countries have not yet assimilated democracy or they have not yet cultivated a culture of democracy. SSA countries are said to be countries of new democracy. These countries are still learning about democracy, hence stumbling on this path of initiation to democracy.

Another reason for the positive effect of democracy on the SPI could be the fact that SSA countries do not yet have the prerequisite to go to democracy. To opt for democracy, you need a minimum of achievements at the economic level (an acceptable level of income per capita, a low poverty rate, etc.), at the social level (good social cohesion, national unity and good level of education) and at the political level.

The third reason could be the fact that democracy is not the right system, least not yet, for African countries. Other political systems (dictatorship, monarchy ...) could allow SSA countries to reduce SPI.

This positive and significant coefficient of democracy confirms the hypothesis 2 which is that democracy does not prevent electoral unrest in SSA, however, it aggravates the instability.

¹⁷ Keech (1995) talks about the costs of democracy when it has undesirable effects on society as a whole. SPI could therefore be seen as a cost of democracy.

For Alesina and Rodrik (1995), transitional democracies (the period preceding the democratic period, for example authoritarian and dictatorial regimes) constitute the most vulnerable types of power (social, political and economic instability). They show that this is the case in Latin American countries.

The estimate (B)

In this second regression, in addition to income inequality and democracy, we add inflation and GDP growth. The coefficients of income inequality and democracy remain significantly positive. When it comes to inflation, the coefficient is significant and negative. This negative sign does not conform to economic theory because inflation is supposed to be the cause of unrest and uprisings. GDP growth is not significant.

The estimate (C)

In this regression, we take into account all the variables of the model. Whereas Democracy remains positive and significant, Income inequality is negative. The variable Inflation is not significant. GDP growth coefficient is positive and significant. The economic growth that is supposed to improve the populations' living conditions increases the SPI in SSA. This result raises questions about the distribution of the fruits of growth. If the distribution of wealth is not done well, it can create income inequality which causes SPI.

The sign of Education is negative and significant. Education and training reduce SPI. The higher the intellectual level of a country's population is, the less the SPI is. The theoretical and empirical literature does not recommend the negative sign of Natural resources. The Dutch disease theory stipulates that the richer a country is in natural resources, the more unstable it will be.

Urbanisation helps to reduce SPI. This could be explained by the fact that urban areas are more docile to the central government and its representatives. The more the villages modernise, and the cities grow, the more democracy there is. Huntington (1968) and Berg and Sachs (1988) argue the opposite: urbanisation leads to social demand and increased redistributive politics. The variable Fractionalisation is not significant.

CONCLUSION

The main objective of our research is to analyse income inequality as a determinant of SPI for a sample of 47 SSA countries over the period from 1990 to 2018. During this study, the democracy has been inescapable both theoretically and empirically.

Our research's main objective is to analyse income inequality as a determinant of SPI for a sample of 47 SSA countries over the period from 1990 to 2018. In this study, democracy has been inescapable both theoretically and empirically.

Our econometric approach took place in two steps. In the first step, we used the Hierarchical Clustering on Principal Components approach (PCA plus hierarchical clustering and partitioning) to measure the SPI Index and group the countries according to their similarity in SPI. In the second step, we estimated a linear panel model using the OLS method to analyse income inequality's impact on the SPI.

The SPI analysis allows to conclude that the killings are not linked to the duration of a regime and the duration of a regime reduces if coup d'état (successful or not) are rampant. Many killings characterise the SPI of Nigeria. That of cluster B is characterised by rebellion and assassination of the executive. That of cluster D is characterised by a regime's duration in power and coup d'état (successful or not). That of cluster C is characterised by coup d'état (successful or not).

The econometric estimate results indicate that income inequality in SSA countries has a significant and positive impact on the SPI. We find these results in the presence of democracy, inflation and economic growth. Our results also reveal that democracy causes SPI more than income inequality does. Democracy is largely responsible for SPI in SSA countries. Democracy, in its conception, is to reduce SPI. This result could be explained by the fact that SSA countries are new democracies or these countries are still learning the rules of democracy or democracy is not the right system, least not yet, for African countries. The GDP growth that is supposed to improve the populations' living conditions increases the SPI in SSA. This result raises questions about the distribution of the fruits of growth. Education reduces SPI.

Several possible solutions to reduce the SPI could be explored.

To reduce the SPI, it is necessary to reduce income inequality. This requires a better distribution of the wealth. A good application of democracy will considerably reduce the SPI. Otherwise, we could resort to other political systems (dictatorship, monarchy ...).

Investing in education is an effective way to reduce SPI. A well-educated person is likely to find a job and not engage in acts of SPI.

This chapter analyses only the impact of income inequality on the SPI. The theoretical and empirical literature show us that the relationship between income inequality and SPI is bilateral. A future study could analyse the impact of the SPI on income inequality.

One of the results of our research is that democracy positively affects SPI while in theory, democracy is made to reduce SPI. This result poses the following problem: are SSA countries able to apply the democratic system? Do these countries fulfil all the conditions to apply democracy? A subsequent study that analyses the determinants of democracy in SSA would answer these questions.

Subsequent research could analyse the relationship between SPI and income inequality for SSA countries grouped according to the origin of the colonizer.

SPI considerably reduces the time horizon, not only of the private investor, but also of the political decision-maker. The latter, facing the SPI, is not encouraged to respect its commitments, nor the rules and principles that regulate economic activity. In a context of political instability during an election period, the government, whether democratically or not, may be tempted to resort to a policy based on the establishment of clientele's allegiances, and on the manipulation of voters to retain power.

In situations of political instability, fiscal policy is the tool used by leaders to get re-elected. The next chapter titled Electoral Budget Cycle (EBC) allows us to address the following questions. How is fiscal policy handled during an election period? What is the impact of SPI on the management of fiscal policy?

CHAPTER II

ELECTORAL BUDGET CYCLE IN SUB SAHARAN AFRICA

"Macroeconomics and politics are deeply interconnected. Elections are won or lost as a result of economic conditions. However, ideological and electoral incentives influence the choices of macroeconomic policies. "

Alesina A., Mirrlees J. and Neumann M. (1989, p.57).

INTRODUCTION

The collapse in prices of agricultural export commodities in the late 1970s and early 1980s caused a sharp decline in government revenue in many sub-Saharan African countries. This has reduced the financing capacity of their social policy. In addition to this, the advent of the democratization process in the early 1990s sets the stage for a possibility of political alternation. These events cause for power of more concern for their re-election.

The governors manipulate the variables of fiscal policy during the electoral period with the aim of being re-elected: it is the Electoral Budget Cycle (henceforth EBC). We choose to treat the EBC for the 47 SSA countries for two main reasons. Fiscal policy variables are easily accessible and their effects are more evident and more immediate when compared with monetary policy and other economic policies.

Drazen (2001, p.77) argues that "A principal conclusion is that models based on manipulating the economy via monetary policy are unconvincing both theoretically and empirically, while explanations based on fiscal policy conform much better to the data and form a stronger basis for a convincing theoretical model of electoral effects on economic outcomes."

Moreover, since monetary policy is developed and conducted by the central bank, its independence from the government does not allow leaders to manipulate money supply for electoral purposes.

Therefore, fiscal policy is subjected to probable manipulation during an election period. These arguments lead us to consider only fiscal policy (within economic policy) as an economic variable manipulated during the election period.

Fiscal policy is an instrument of economic policy, available to governments, whose purpose is the use of public expenditures and revenues to achieve economic stability objectives. The objectives of fiscal policy are in threefold: resource allocation, cyclical stabilization and redistribution of resources.

The electoral cycle can be detrimental to the economic stability sought due to the budgetary manipulations it causes. During the elections, the governors manipulate the fiscal policy variables to be re-elected. This manipulation of fiscal policy generally does not follow any economic theory. The only goal is their re-election.

Since the seminal contributions of Nordhaus (1975) and Tufte (1978), a rich theoretical and empirical literature has been developed on the existence of the EBC¹. This literature explains how governments use fiscal policy instruments during the election period and the impact of their decisions on macroeconomic variables during the election period.

The power seeks to manipulate the fiscal policy in order to obtain economic results guaranteeing him a victory during the election. Their goal is therefore the re-election. Political parties "do not seek to gain office in order to carry out certain preconceived policies or to serve any particular interest groups; rather they formulate policies and serve interest groups in order to gain office." (Downs, 1957, p.137). The EBC is therefore a periodic fluctuation of fiscal policy according to the electoral cycle.

Acemoglu and Robinson (2001) point out that rulers (who are the rich) do not manipulate fiscal policy for redistribution voluntarily. They do so for fear of suffering reprisals from the poor people.

SSA countries are countries with relatively low levels of democracy. In addition to this, the fiscal policy is an easily manipulable instrument. It is therefore important to understand how the uncertainty to be re-elected influences fiscal policy decisions.

This chapter is to highlight the manipulation of the fiscal policy by the political leaders during the elections in SSA countries. There is another contribution that is empirical. Our econometric contribution is that we apply the model of the EBC exclusively to a sample of SSA countries. This second chapter allows us to assess how fiscal policy is managed during an election period. In other words, is there an EBC in SSA countries, if so, how is it?

The first objective of this chapter is to check if there is an EBC in the SSA countries, which allows us to know if the elections have an impact on the management of the fiscal policy. The second objective is to see how the EBC, if it exists, manifests itself in SSA countries. The third objective is to verify whether the EBC is an opportunistic cycle or a partisan cycle.

Satisfactory conduct of our research requires taking into account two hypotheses.²

Hypothesis 1: There is an EBC in SSA countries.

Hypothesis 2: The EBC is more important for social spending than for research and development expenditures.

¹ It can also be called: Political Budget Cycles, Political Business Cycle (henceforth PBC).

² We cannot check the partisan EBC cycle in SSA because of lack of data on the political ideology variables for SSA countries. To our knowledge, there are still no data on expenditures (social, research and development) and tax revenue for each ethnic group and religion in SSA countries.

This second chapter is structured in two main parts: the literature review and the methodology.

The literature review analyses the different theories of political economy (our topic is on political economy) on which our research is based. Then it further presents the debate on the use of fiscal policy during the electoral period.

The second part measures the impact of elections on fiscal policy variables. An econometric approach allows us to verify the existence of the EBC. The Generalized Method of Moments (GMM) proposed by Blundell and Bond (1998) is used to estimate a linear dynamic panel model of the EBC.

I) LITERATURE REVIEW

We make a theoretical review and an empirical review separately. The theoretical review addresses economic theories on which our research is based. Our theme is on political economy, we will assess the theories related to the political economy that we apply to SSA countries. The empirical review allows us to review the various research that has addressed the relationship between electoral cycles and fiscal policy decisions.

1. Theories related to political economy

We analyse the theories of political economy used in our research without pretending to be exhaustive.

1.1 Political Economy

Political economy is the domain of the economy which applies the tools of economic analysis to political phenomena, which constitutes a real conceptual revolution in the vision of the State. Political economy refers to the branch of economics that describes and analyses economic activity in relation to political data.

Indeed, among the first neoclassical, the state is virtually absent, it is an unproductive but inevitable activity whose impact must be limited. State analysis is limited to the effects of the tax burden and the search for the best tax; the state must be as neutral as possible economically. While the Pigou school and the Keynesian school argue that political leaders must intervene in the economy to ensure the general interest, the political economy maintains that political leaders act according to their own interests, whether legitimate or not. They use economic policy to achieve their personal needs, including re-election.

In everyday life, individuals pursue their personal interests and react according to constraints. It's the same for politicians. Political economy applies the tools of economic analysis to politicians.

Kenneth (1990) considers a model where voters and politicians are rational agents who maximize their utility and well-being. The political economy proposes that political institutions not be considered as variables exogenous to macroeconomic policy, but it now gives them the status of endogenous variables. That is the conception of the new political economy.

The Electoral budget Cycle

We cannot talk about the EBC without defining the Political Business Cycle (henceforth PBC). The most famous modelling of the PBC is that formulated by Nordhaus (1975) and MacRae (1977). Nordhaus (1975) draws on the Phillips (1958) curve and finds that governments, using the instruments of fiscal and monetary policy, are able to generate the "Political Business Cycle". Leaders create favourable economic conditions before and during elections that could increase the likelihood of re-election.

Thus, for Nordhaus (1975), the governors apply a policy of stimulus before the election (lower unemployment and high inflation) and a restrictive policy after the election to regain control of inflation. According to Alesina et al. (1989), Nordhaus's (1975) approach is supported by three hypotheses: (i) The political parties are only concerned with winning the elections. (ii) Voters are not well informed and can be deceived by politicians. (iii) The economy is described by the Phillips (1958) curve.

The historical fact behind the theory of the Political Business Cycle and the Politico-Budget Cycle is the presidential election in the United States in 1972. A few weeks before the election, President Nixon increased social security benefits by about 20% and indexed them to inflation, while the money supply increased by more than 8% compared to about 4% in the three previous and subsequent years. It is this manipulation of economic policy by President Nixon to get re-elected which inspired the first authors (Nordhaus 1975, Hibbs 1977).

The EBC reflects a periodic fluctuation of fiscal variables induced by the electoral cycle. Voters will appreciate the management of politicians and renew their confidence based on the performance achieved in the past and present. Governors manipulate fiscal policy variables in the direction that meets the expectations of citizens during elections; they are then forced, after elections, to restore the balances eventually destroyed with what this entails as consequences for the economy.

The decisions of the political parties do not obey any economic theory. Political parties only practice economic policies that allow them to win elections. It does not matter to them the consequences of their economic decisions on the macroeconomic variables after the elections, the most important for them is to get re-elected.

The Opportunistic Political Budget Cycle and the Partisan Budget Cycle

Two theories explore the fluctuations of fiscal policy around elections: the opportunist cycle and the partisan cycle.

The literature on the opportunistic cycle argues that electoral pressure pushes the power to manipulate fiscal policy to increase the likelihood of re-election. This leads to variations in fiscal policy variables such as increase in social spending, infrastructure spending etc. before or at the time of elections. The opportunistic EBC has consequences for economic quantities such as increase of employment, inflation, decrease of economic inequalities. According to the authors of EBC (Rogoff and Sibert 1988, Rogoff 1990, Gonzalez 1999b, and Shi and Svensson 2002) information asymmetry, the corruption, and the low level of democracy amplify the size of opportunistic cycles.

The study of opportunistic cycles reveals two theoretical nuances: The rational opportunistic cycle (the most recent) and the traditional opportunistic cycle (the oldest one). In the rational opportunistic cycle, economic agents form rational inflation anticipations. The power cannot lie. This theory is supported by Alesina (1987), Kenneth and Silbert (1988), Rogoff and Silbert (1988), Rogoff (1990). This new EBC appeared thanks to Lucas (1976) who suppresses the information asymmetry hypothesis. For traditional opportunistic cycles, economic agents form adaptive inflation expectations: politicians are able to repeatedly mislead voters because voters do not have complete information about the economic system (Nordhaus, 1975; Buchanan, 1975).

The alternative approach to the opportunistic political-budget cycle - the partisan political-budget cycle - argues that policies are predetermined by ideology.

Hibbs (1977) is the main defender of this point of view. This author argues that the Democratic Party in the United States and the Socialist Parties in Europe were more opposed to unemployment and less opposed to inflation than the Republican Party in the United States and the conservative parties in Europe. This theory has been empirically tested by Hibbs (1977) and others, using the Phillips (1958) curve models.

In partisan cycles, voters evaluate candidates on partisan bases (Tufté, 1978). The partisan cycle is based on ideology: the ideology of the left parties and the ideology of the right parties are the two most used ideologies. In the case of the United States, the comparison is made between Republicans and Democrats. Once elected, the new power applies policies that obey the ideologies of their supporters. This is what encourages voters to vote for candidates who defend their ideologies.

1.2 Conceptual approach

Political market

The political system is considered as a competitive market opposing producers, the candidates, to convince the consumers, the voters. Producers (candidates) offer speeches, slogans of promises and especially services and arrangements. Voters exchange their vote against the promises of politicians if these promises meet their expectations.

The politician is an entrepreneur who seeks to maximize the number of his constituents. The instrument of exchange for voters is their vote to obtain or improve income, employment, security, in short well-being. Producers are rewarded with good election results if their offer meets consumer demand. To be competitive (that is to say, to meet the demands of voters) producers adopt several strategies of positioning on the market. They develop a brand image, they come together to showcase their comparative advantages.

For the liberals, the main role of this political market is to organize a peaceful alternation in power. However this is not always the case, we see that there are elections with crises and disorders in SSA countries.

Median voter theorem

In the majority voting system, the vote of an elector is unlikely to influence the result because of the high number of voters. However a particular voter plays an important role: the median voter. The median voter is the voter who is at the centre of the cumulative distribution of political preferences. To win the elections you have to win 50% of the votes plus one, which is that of the median voter. That makes the voice of the median voter important.

Does a system of collective choice based on votes by a majority of votes make it possible to find the solution to any question? Condorcet (1785) replies in the negative because for him such a system can lead to unstable majorities.

Black (1948) attempts to solve this problem by stating the median voter theorem. He demonstrates that a stable majority can emerge if three conditions are met. First of all, if the question put to the vote is one-dimensional. That is, we are dealing with only one problem at a time. Then, if the individual preferences are unimodal, which means that for each voter there is only one preferred solution to all other solutions. Finally, if all the possible choices are compared two by two and put to the vote.

Candidates should make their programmes converge towards the satisfaction of the utility and well-being of the median voter.

Rent seeking

The rent seeking concept is defined as the means to make a profit (example income, honours) by undertaking activities that are unproductive. These activities produce returns, but do not produce goods and / or services (Bhagwati, 1987). Economic interests are private, in favour of a minority, and are at the expense of the general interest.

Rent seeking is about manipulating or exploiting the economic or political environment to make a profit. This profit does not correspond to an activity bringing surplus wealth to the community but rather a personal profit. The theoretical development of this concept was initiated by Tullock in 1967. In a pioneering article entitled "The social costs of tariffs, monopolies and theft", the author lays all the foundations of the theory of rent-seeking. Nevertheless, it is Krueger (1974) who will use for the first time the expression "rent seeking".

Rent seeking leads to several losses. Capital is diverted from very useful sectors of production. Thus, rent-seeking lead to the reduction in total production. For Stiglitz (2017b, page 63) "One key set of policies are those that give rise to rents. Since the wealthy are better able to lobby for such rents and are more likely to own the corporations which successfully do so, this rent seeking is typically inequality increasing". Corruption is the closest variable to rent seeking. Corruption in developing countries appears as a source of rent-seeking. For Vornetti (1998), since rent-seeking describes all the activities carried out in order to benefit from a redistribution of collective wealth, corruption appears to be a particular form of rent-seeking.

Rent-seeking is also at the root of SPI. One of the direct consequences of rent seeking is the unequal distribution of income. Groups of people who feel aggrieved by the unequal distribution of income incur revolutions. The concept of rent seeking is often used to highlight the negative impact of state intervention in the economy. Regulations are necessary.

Theory of the electoral cycle

The theory of the PBC and the theory of the electoral cycle are two closed theories whose definitions are very similar. The PBC is the highlighting of an economic cycle modelled on the electoral calendar. This definition is also that of the electoral cycle theory.

The electoral cycle theory is defined as the consequence of the use of economic policy by leaders to increase their chances of re-election. It is the fluctuation of production and employment caused by the manipulation of the economy for electoral purposes. Economic research on electoral cycles has mainly been conducted by the school of public choice, based on the work of Nordhaus (1975).

Theory of public choice

The theory of public choice aims to apply economic analysis to political institutions. The starting point of this theory is that politicians and voters should be seen as ordinary people who seek to maximize their own self-interest and do not work in the interest of the population or for the hypothetical common good.

This theory strongly questions the effectiveness of the state. For the economists of this school of thought, there is no benevolent welfare state that seeks to maximize the collective well-being. The paradigm of homo oeconomicus is applied to voters and politicians: homo politicus.

According to public choice theory, elections are an integral part of a political market. Buyers in this market are voters. They seek favours and privileges from the government. Politicians are the providers of these favours and privileges.

Buchanan, the father of public choice theory, argues that thinking that the state would be omniscient is not only unfounded but dangerous. It engenders the risk of the tyranny of the majority already denounced by Alexis de Tocqueville. In reality, the state is spending today trying to ensure, for example, its re-election, and others will pay tomorrow.

The purpose of public choice theory is to reflect on institutional mechanisms capable of constraining the excessive increase of the public deficit and debt. This requires "tying the hands" of policymakers to avoid their natural tendency to pursue expansive policies that soon impose taxes in the form of inflation rates.

In summary, the theoretical conception of the EBC has evolved from Nordhaus (1975) to now. Voters are increasingly aware of the consequences of manipulating fiscal policy variables.

2) Empirical review

There is a vast empirical literature on the EBC. One of the authors who conducted a complete review of the theoretical and empirical literature on this topic is Drazen (2001).

2.1 Electoral Budget Cycle

The majority of empirical studies on the relationship SPI - Fiscal Policy is unanimous on the fact that fiscal policy tends systematically to be manipulated during the electoral period, it is the EBC. This literature on EBC has helped to understand how elections determine the provision of public goods, taxation, and the form of income distribution.

The most used electoral measures are the increase in the volume of transfers, social spending and tax cuts to temporarily increase disposable income and the volume of employment.

The choice of these measures is based on a set of considerations, including the degree of ease of their implementation and the speed of their effects. These electoral measures exert, directly or indirectly, a positive influence on income.

The most visible components of the expenditures that are the construction of infrastructures (construction of roads, power stations...) and the social expenditures (health and education) are developed before the elections. While the less visible components (debt refund, investments in research ...) are reduced during this period. Once the elections are over, they ignore them and do their own thing.

The power makes them increase their discretionary funds during the election years to make donations to religious and / or social institutions; they organize cultural events, sports. All this to gain popularity. These discretionary funds are budgeted in the form of donations or social assistance. Short-term policies hinder the accumulation of capital and hinder economic growth. In general, the decision-making horizon is the short-term, the time interval between two elections.

Uncertainty about who will be in power tends to increase the government's share of GDP. This uncertainty pushes leaders to abandon productive work to focus on rent-seeking. Rents are the personal profits that politicians get from their political activities.

In sum, the EBC has a negative impact on economic policy, on the economy and on macroeconomic variables because it doesn't follow to any economic law. The EBC is relevant where voters cannot effectively control fiscal policies.

Empirical spatio-temporal review

The results of the researches on EBC can be classified chronologically. Then we take as a criterion the geographical position of the countries on which these researches are carried out. Nordhaus (1975) is the pioneer of the PBC. After him, there is the study of Kramer (1971) followed by that of Tufte (1978) and Fair (1978) which influenced the studies on the PBC. Hibbs (1977) is the first to prove the existence of partisan cycles. After this first group of authors, we can mention Alesina and Tabellini (1990), Lockwood et al. (1996), Devereux and Wen (1998); Shi and Svensson (2002); Persson and Tabellini (2003a, 2003b); Brender and Drazen (2005).

Most PBC research uses US data (Nordhaus 1975, MacRae 1977, Hibbs 1977, and Tufte 1978). Data from OECD countries are used by Alesina and Roubini (1992), Alesina et al. (1997), Kenneth (1987, 1990), Angelopoulos et al. (2008), Veiga and Veiga (2007a).

Ames (1987) shows in a panel of 17 Latin American countries that during the period 1947-1982, government spending rose by 6.3% before the elections and decreased by 7.6% after the elections.

Asian countries are not left behind (Sjahrir et al., 2013). Blais and Nadeau (1992), Galli and Rossi (2002) show that Canada also has the EBC. In Israel, Ben-Porah (1975) shows the existence of the EBC between 1952 and 1973. Krueger and Turan (1993) show the existence of EBC for Turkey for the period 1950 to 1980. Drazen and Eslava (2010) for Israel.

EBC at the level of decentralized communities

The issues of the EBC apply both at the national level (government action) and at the level of local jurisdictions.

In the early 1990s, Rogoff (1990, pages 33 and 34) points out that for the EBC, "it would be more promising to focus empirical research on data for state and local elections, instead of focusing solely on the small number of observations available for national elections".

Akhmedov and Zhuravskaya (2003) studied a panel of local Russian political jurisdictions and found an increase in public spending before the elections and a decrease soon after. The government deficit also increased before the elections, but no evidence was found as to the evolution of local tax revenues before or after the voting period. Sjahrir et al. (2013) conduct research on 271 Indonesian districts for the period from 1994 to 2009. They find that there is the EBC in Indonesia at the local level on discretionary spending.

2.2 Electoral Budget Cycle in developing countries

To date, few tests of the existence of the EBC have been carried out on developing countries, particularly in SSA countries.

Empirical research to examine the existence of the EBC in developing countries indicates that it is the opportunistic cycles that are most applied in developing countries (Block, 2001, Gonzalez, 2002b).

The partisan model has partly succeeded in explaining macroeconomic fluctuations in OECD and developed countries (Alesina and Sachs 1988). However, no study on the experience of developing countries uses the partisan model. This is partly due to the lack of data.

Schuknecht (1996) is the first to study the EBC for 35 developing countries over the period from 1970 to 1992. He argues that in developing countries spending (income or food redistributions, job creation through public) are more visible than lower taxes. Which affects more the voter's decision.

Another study by the same author in 2000 on 24 developing countries results in essentially the same results. Expansionary fiscal policies during elections increase spending and public investment (Schuknecht, 2000).

In a study of low-income countries, Ebeke et al. (2013) state that the pre-election budget deficit is greater than 1%. For these authors, during the two years following the elections, the fiscal recovery takes the form of an increase in trade taxes and the reduction of public investment. But the public consumption is not significantly reduced. Gonzalez (2002a) found evidence of opportunistic fiscal cycles in Mexico and showed that they are related to the levels of democracy and transparency in budget management.

Block (2001) uses annual data for 69 developing countries to show that EBC occur only in countries with strong electoral competition. He obtains this result from a sample of 44 African countries. In addition, he finds that more voters are informed, more cycles decrease.

Shi and Svensson (2006) add that politicians benefit from the high proportion of poorly informed and inexperienced voters in developing countries. This gives them the opportunity to engage in manipulations of fiscal policy to be re-elected.

Research on the EBC has also covered both developing and developed countries.

Shi and Svensson (2002) analysed data from 123 countries and found evidence of cycles in both developed and developing countries, with stronger evidence in developing countries. Persson and Tabellini (2003a, 2003b) also provided evidence of EBC in both developed and developing countries. Subsequent work by Brender and Drazen (2003) has shown that evidence of EBC in developed countries is unreliable due to the transparency of their budget management. However, evidence of EBC in developing countries is influenced by their immature democracy. With regard to economic policy instruments, research on industrialized countries focuses on transfers. This is not the case for developing countries where research is increasing on social spending.

EBC in developing countries are more pronounced than those in developed countries. Shi and Svensson (2002) and Gonzalez (2002a), relying on Rogoff (1990) show that this difference is due to the institutional environment. Laws are not binding on budget mismanagement and rent seeking, while public policies tend to be geared towards personal gain (IMF, 2007).

Another reason mentioned by Akhmedov and Zhuravskaya (2003) is the underestimation of the EBC due to insufficient data. Researchers fail to provide evidence of the existence of the EBC especially in SSA countries. All this leads Schuknecht (2000) to argue that the Nordhaus (1975) approach seems more appropriate for developing countries, especially for SSA countries.

On the whole, all research on developing countries has several points in common: developing countries are new democracies, asymmetry of information and corruption are pronounced. This characteristic presented by SSA countries accentuates their EBC. In these countries, it is the opportunist cycle that is more perceived in relation to the partisan cycle.

Our research analyses the EBC for a sample made up only of SSA countries.

2.3 Difference of the Electoral Budget Cycle according to the political regime

In their book "The Economic Effects of Constitutions", Persson and Tabellini (2003a page 12) ask the following question: "If the UK were to switch its electoral rule from majoritarian to proportional, what would this do to the size of its welfare state, or its budget deficit? If Argentina were to abandon its presidential regime in favour of a parliamentary form of government, would this help the adoption of sound policies towards economic development?"

The EBC is variously perceived by economists according to the political system.

Persson and Tabellini (2002) find, with a sample of sixty democracies from 1960-1998, that pre-election tax cuts are a universal phenomenon. Post-electoral budget adjustments (spending cuts, tax hikes and surplus increases) are only present in presidential democracies.

In parliamentary democracies, negotiation between different legislative coalitions can lead to a government crisis. This threat increases overall spending, increases unnecessary spending in parliamentary systems compared to presidential regimes. Persson and Tabellini (1999); Lizzeri and Persico (2001); Milesi-Ferretti et al., (2002) find strong empirical support for the prediction that parliamentary systems have higher expenditures.

For Sjahrir et al. (2013), the reason why there is no EBC in Indonesia (newly democratized country) is that parties in power often do not have a majority in parliament and therefore cannot increase the budget of election year. For this, the EBC only occurs in direct elections, because during these elections, those in power can deceive the voters. In indirect elections (the legislative elections), the governors must find other ways to persuade the deputies to re-elect them.

Some studies indicate the presence of EBC in authoritarian countries. Lisa argues that authoritarian powers manipulate the economy in the same way as democratically elected leaders. This is evidenced by the case of Egypt during the twenty-five years of electoral authoritarianism under President Hosni Mubarak. Krueger and Turan (1993) argue that Turkey introduced EBC between 1950-1980. Shi and Svensson (2002) found pre-election budget deficit increases in a large sample of democratic and authoritarian countries. They point out, however, that authoritarian leaders are less subject to the norms of economic policy than the leaders of democratic countries.

Persson et al., (2003a, 2003b) indicate that there is not enough EBC in mature democracies compared to new democracies (Shi and Svensson, 2002; Brender and Drazen 2005). The interpretation of these results is that the leaders of the new democracies are less subject to the norms of economic policy than the leaders of democratic countries. The reason is that voters are better able to monitor and evaluate fiscal policy process in mature democracies. This reduces the possibilities of electoral manipulation of public finances in comparison with new democracies.

Political instability affects fiscal policy differently depending on whether one is in a democracy or parliament political systems. Persson and Tabellini (2001) and Milesi-Ferretti et al., (2002) point out that presidential democracies alone are associated with increases in spending during the pre-election period. Budget adjustments (spending cuts, tax increases) occur during the post-election period.

However, parliamentary systems are associated with the expansion of social protection spending both before and after the elections. Milesi-Ferretti et al., (2002) justify this by the fact that individual political responsibility gives stronger incentives than collective political

responsibility. Several recent studies (Persson and Tabellini (200), Lizzeri and Persico (2001) Milesi-Ferretti et al., (2002)), find that elections in parliamentary systems lead politicians to seek the support of large groups in the electorate through general spending programs.

For Acemoglu and Robinson (2001), the manipulation of fiscal policy is the result of power relations between the rich and the poor. Undemocratic societies are controlled by the rich and the poor are excluded from political power. The problem is that tax policy are progressive in a democratic regime, so the rich prefer an undemocratic regime to apply a system of regressive tax policy. When the rich is in power, the only recourse left to the poor is a revolution to gain power and impose democracy. Fear of the revolution of the poor will lead the rich to power to make concessions by distributing income. They will do it to the point where it avoids the revolution.

There is also a debate on the role of parliament in the conduct of fiscal policy.

In the parliamentary system as in the presidential system, it is the parliament which is in charge of the control of the execution of the budget. This role of parliament presents several disadvantages. Parliamentarians' budget amendments can reduce revenues or increase spending. This can undermine the general policy of the government. It is for this reason that authors prefer the authoritarian system and the dictatorship. In such systems, governments make the choice of fiscal policy without any constraint. They can thus guide expenditures and revenues to achieve economic policy objectives.

This theoretical and empirical review of the EBC allows us to appreciate the novelty and the rupture of the conception of the State by the economists: it is wrong to think that the State acts only for general interests, it acts for his own interests, especially to get re-elected.

II) METHODOLOGY APPROACH

What are the voters' choice criteria: religion, region, ethnic, professional corporation, or government programmes? Do the fiscal policy variables (expenditures, revenues) show systematic patterns before and after the elections?

After having covered the theoretical and empirical literature on the issue of the opportunistic and partisan EBC, we make an econometric research on the EBC in the 47 SSA countries of our sample.

1) Model of the electoral budget cycle

1.1 Model

The reference model for analysing the relationship between the electoral cycle and fiscal policy is the model of the EBC. This model has been used by Shi and Svensson (2002, 2006), Veiga and Veiga (2007a), Sakurai and Menezes-Filho (2011), Chortareas et al. (2016), Ebrima (2007) ...

The model is specified as follows:

$$y_{ijt} = \alpha + \beta_j y_{ij(t-1)} + \gamma Elections_{it} + \delta X_{ikt} + \eta_{ij} + \lambda_{tj} + u_{ijt} \quad Eq. (2.1)$$

$i = 1, \dots, N$. $N = 47$ size of our sample, the number of countries that make up our sample.

$j = 1; 2$ and 3 . Fiscal policy variables (social spending, research and development expenditure and tax revenue).

$t = 1, \dots, T$ the time, the period starts from 1990 to 2018, $T = 28$.

$k = 1, \dots, 7$ the control variables.

1.2 Variables

y_{ijt} : The fiscal policy variable j in country i at time t . The fiscal policy variables are used to test the existence of the EBC.

The EBC test is implemented for three fiscal policy variables: social spending ($j = 1$); research and development expenditures ($j = 2$) and tax revenue ($j = 3$). These three variables are expressed in percentage (%) of GDP.

Social expenditures ($j = 1$): Social expenditures cover cash benefits, goods and services provided directly by the State and social tax cuts. They consist of health, education, family allowances, sanitation and infrastructure expenditures.

In our research, we approximate social expenditures to health and education expenditures. These expenditures are supposed to have a positive impact on the results of the elections in the short term, for that they are prioritised by the governors.

Research and Development Expenditures ($j = 2$): They include both capital and current expenditures in the four main sectors: Business enterprise, Government, Higher education and Private non-profit. As the research and development expenditures of the private sector is very small in SSA, we approximate the research and development expenditures to the research and development expenditures of only the public sector. These expenditures influence positively the elector's decision in the long term. During the election period, these expenditures are supposed not to be a priority for the governors who are candidates.

Tax revenue ($j = 3$): Tax revenue refer to mandatory government transfers for public purposes. Tax revenue includes taxes and other levies collected by the state. Tax revenue is expected to decline in the pre-election period and increase in the post-election period.

Some authors have also used the budget balance as an exogenous variable in the EBC model. The first to do so are Veiga and Veiga (2007a), Shi and Svensson, (2006); Brender and Drazen (2004). We choose these three variables (social expenditures, research and development expenditures, tax revenues) for reasons of data availability.

$y_{ij(t-1)}$: The dependent variable delayed by one period to capture the persistence of fiscal policy variables.

$Elections_{it}$: The electoral variable, it takes the value 1 during the election year and 0 elsewhere. This dummy is introduced to test the three hypotheses listed in the introduction of this chapter.

The World Bank's Political Institutions Database provides broad coverage of political systems and country elections. We use legislative elections for countries with parliamentary systems and presidential elections for countries with presidential systems.

X_{itk} : is a vector of controlled variables that is a set of variables to control macroeconomic shocks.

We introduce these variables because they make possible to explain the dependent variable and to avoid the biases related to the correlation between the explanatory variables and the residues. These controlled variables are classified into four groups: economic variables, demographic variables, political variables and political ideology variables.

Economic variables

Economic variables include debt and the rate of urbanization. The level of debt $Debt_{it}$ affects the current budget (it increases it) and future budget (we must proceed with the payment). It thus creates a link between electoral cycles. This variable makes the electoral competition dynamic (Battaglini, 2014). The EBC can be affected by the level of debt. We take the Central Government Debt (%GDP) of the Global Development Finance & World Development Indicators to measure the debt.

The rate of urbanization $Urba_{it}$: The urban population refers to people living in urban areas, as defined by the United Nations. The presence of this variable in the regression makes it possible to assess the behaviour of the EBC in SSA countries according to the rate of urbanization.

The demographic variables

To account for the effect of population on government expenditures, we consider the following variable: Pop_Struct_{it} .

Pop_Struct_{it} represents the percentage of the population between 14 and 64.

This variable allows us to verify to which segments of the population the fiscal policy variables are oriented. By intuition, the expenditures must be directed towards the populations who are voters.

Political variables

Concerning the political variables, we take the rent seeking ($Rent_{it}$), the information of the voters ($Information_{it}$) and the efficiency of the government ($Efficiency_{it}$) because the behavior of the politicians depends on the political institutional environment.

$Rent_{it}$: The higher the benefits of politicians to power (rent seeking), the greater the incentives to influence voter choice before elections. The rent seeking of politicians are the personal profits that politicians derive from their presence in power. These benefits can be financial and non-financial (privileges, honours, power, presidential immunity ...). To measure the rent seeking, we use the variable corruption, taken from the World Development Indicators, as proxy (Svensson 2000; Mohtadi and Roe 2003).

$Information_{it}$: The more the voters do not perceive the consequences of the pre and electoral budget manipulations, the more the governors apply short run fiscal policies (fiscal policies that are just necessary to win the elections). The voter information proxy is measured by the product of "radios per capita" by "freedom of broadcasting" (Shi and Svensson, 2006). The "radios per capita" is from the Global Development Network Growth Database (World Bank) and the "freedom of broadcasting" is from Freedom House.

$Effectiveness_{it}$ captures the quality of public services and the independence of the public service from political pressures. It also helps to assess the credibility of the government's commitment to its policies. Government effectiveness is an aggregate indicator with a value ranging from -2.5 to 2.5. When the value of government effectiveness is negative, the value of the variable $Effectiveness_{it}$ is 1 and when the value of government efficiency is positive, the value of the variable $Effectiveness_{it}$ is 0.

Political ideology variable: Ideology_{it}

Political ideology can influence budget decisions during an election period. The government can direct spending to people who share its ideology. This allows him to ensure its re-election. Taking this variable into account allows us to verify the existence of the partisan cycle in the SSA countries of our sample. This variable $Ideology_{it}$ takes the value 1 when the political ideology is dominated by tribalism, regionalism, ethnicity and religion and 0 elsewhere. There are still no data on expenditures (social, research and development) and tax revenue for each ethnic group and religion in SSA countries.

In the literature, most variables of political ideology are dummy that take the value 0 for left parties and 1 for right parties (Sakurai and Menezes-Filho 2011, Rodrigues 2002, Hibbs 1977; Veiga and Veiga, 2007a). In the United States of America, political ideology focuses on Republicans and Democrats.

We recall the model which is the following:

$$y_{ijt} = \alpha + \beta_j y_{ij(t-1)} + \gamma Elections_{it} + \delta X_{ikt} + u_{ijt} \quad (2.1)$$

We summarize all the variables of the model in the following table:

Table 10: Variables of the equation (2.1)

	DESCRIPTION		ORIGIN
y_{ijt}	$j=1$	Social expenditure	World Development Indicators
	$j=2$	Research and development expenditure	
	$j=3$	Tax revenues	
$Election_{it}$	takes the value 1 during the election year and 0 elsewhere.		World Bank's Political Institutions Database
X_{it}	$Urbanisation_{it}$	The rate of urbanization	World Development Indicators
	Pop_Struct_{it}	The structure of the population by age	
	$Rent_{it}$	The rent seeking	
	$Information_{it}$	Information	World Development Indicators and Freedom House
	$Debt_{it}$	Debt	Global development network growth database
	$Effectiveness_{it}$	Government effectiveness	Global Governance Indicators

Our assumptions about the evolution of these variables during the election period are as follows:

Table 11: Hypotheses of the signs of the variables

	Election	Debt	Rent seeking	Information	Government effectiveness
Social expenditure	+	+	+	+	+
Research and development expenditure	-	-	-	+	+
Tax revenue	-	-	-	-	-

The hypotheses of the signs of the variables are based on the economy theory exposed when describing the variables.

2) Estimates and results

2.1 The Generalized Method of Moments (GMM) applied to the Dynamic Panel Data Model (DPDM)

We use the GMM to estimate our dynamic panel data model. To better understand and interpret the results of the regression, we first describe the GMM.

Equation (2.1) is a specification of models in standard dynamic panel data.

$$y_{it} = \beta_j y_{it-1} + \delta X_{it} + u_{it} \quad u_{it} = v_i + \varepsilon_{it} \quad i = 1, \dots, n ; t = 2, \dots, T \quad (2.2)$$

The DPDM is characterized by two sources of persistence over time. Autocorrelation due to the presence of a lagged dependent variable among the regressors and individual effects characterizing the heterogeneity among the individuals (Baltagi, 2005; Wooldridge, 2007).

The presence of a lagged dependent variable makes the Ordinary Least Squares (OLS) estimation biased and inconsistent because the lagged variable is correlated with ε_{it} , even if these latter are not serially correlated ($E(u_{it}u_{js}) = 0, \forall i \neq j, s \neq t$). Although fixed effects estimation (FE) eliminates specific effects (v_i), it cannot eliminate the bias introduced by the lagged dependent variable. This bias in the FE model is reduced but not totally eliminated in the case where the number of individuals (N) is fixed and the time dimension of the panel is high (T).

The random effects GLS estimators is also biased in a dynamic panel data model. The Least Squares Dummy Variable Model (LSDV) produces biased results when T is small. This bias approaches zero as T approaches infinity (Nickell 1981). That's why Wilbur and Cheng (1981) propose the use of instrumental variables.

Wilbur and Cheng (1981) suggest first difference the model to wipe out the individual effects and then using instrumental variable (IV) estimation method where y_{it-2} is an instrument of Δy_{it-1} .

Arellano and Bond (1991) show that the Wilbur and Cheng (1981) estimator with IV leads to consistent but not necessarily efficient estimates because it does not make use of all the available moment conditions and does not take into account the differentiated structure on the residual disturbances ($\Delta \varepsilon_{it}$). Arellano and Bond (1991) proposed a generalized method of moments (GMM) procedure that is more efficient. They argue that additional instruments can be obtained with the orthogonality conditions that exist between lagged values of y_{it-1} and the disturbances ε_{it} .

Arellano and Bond (1991) prove using Monte Carlo simulations that the first difference estimate by the GMM is biased when the number of periods is small and has a low precision in the simulation studies. This makes the autoregressive coefficient abnormally high. To correct these problems, Arellano and Bond (1991) develop the GMM estimator in a system that combines the first difference equations with the level equations: the estimation of the equation in level ($y_{it} = \beta_j y_{it-1} + \delta X_{it} + u_{it}$) with the following instrumental variables:

$$Z(-1), Z(-2), Z(-3), \dots, Z(-t), \Delta(Z(-1)), \Delta(Z(-2)), \Delta(Z(-3)), \dots, \Delta(Z(-t))$$

Z = all exogenous variables.

The method of Arellano and Bond (1991) makes it possible to provide solutions to the problems of endogeneity bias and any omitted variables; it also controls individual and temporal specific effects.

In addition, it generates the instruments from the explanatory variables. This is not the case with other traditional methods of instrumental variables (OLS, 2 and 3 stage least squares). An additional benefit of Arellano and Bond (1991) is the possibility of including constants that are not correlated with u_{it} .

Blundell and Bond (1998) show that the lagged-level instruments in the Arellano and Bond (1991) estimator become weak as the autoregressive process becomes too persistent or the ratio of the variance of the panel-level effect v_i to the variance of the idiosyncratic error ε_{it} becomes too large. Building on the work of Arellano and Bover (1995), Blundell and Bond (1998) proposed a system estimator that uses moment conditions in which lagged differences are used as instruments for the level equation in addition to the moment conditions of lagged levels as instruments for the differentiated equation.

Given its superiority in terms of efficiency to heteroscedasticity, autocorrelation in the idiosyncratic errors and the robustness of the results, we use the estimation by the two-step Generalized Method of Moments (GMM) of Blundell and Bond (1998) to estimate the equation (2.1).

We use the Sargan test of over-identifying restrictions and a test of first and second-order serially correlation in the difference equation to test the validity of the instruments used. We also compute the GMM using the Windmeijer (2005) robust standard errors.

2.2 Results

Table 12 presents the results of the estimations of the equation (2.1).

Table 12: Estimate of the equation (2.1)

	Social expenditure	Tax revenue	R_D
Constant	10.24 (14.21)	4.93 (11.88)	0.32 (1.21)
S_expenditure(-1)	0.55*** (0.07)		
Taxes(-1)		0.60*** (0.15)	
R_D(-1)			0.31 (0.25)
Election	0.94** (0.29)	-1.02** (0.43)	0.00 (0.02)
Rent	-2.40** (0.94)	0.56** (0.66)	-0.12* (0.07)
Pop_Struct	0.09 (0.31)	0.19 (0.22)	-0.03 (0.01)
Effectiveness	1.59** (1.20)	2.49 (1.56)	0.31** (0.16)
Urbanisation	0.04* (0.03)	-2.49 (0.08)	0.01 (0.01)
Information	-0.55 (1.08)	1.05 (0.87)	
Debt	0.86 (0.47)		-0.29 (0.26)
AR(1)	0.01	0.05	0.09
AR(2)	0.18	0.87	0.96
Sargan test	1.00	1.00	1.00
Instruments	21	19	10
Observation	143	124	63
Groups	32	22	12

Source: the author using Stata 15

NB: The numbers in brackets are standard errors and the numbers that are not in brackets are the coefficients.

***: significant at 1%; **: significant at 5%; *: significant at 10%.

We present the results of the regressions according to the dependent variables: social expenditures, research and development expenses and tax revenues.

The results of the regressions when the dependent variable is social expenditure.

The coefficient associated with the election variable is positively significant at 5%. It means that during the elections, social expenditure increases. This result is the same found in the literature³. This result is consistent with our first hypothesis.

The variable rent seeking is negatively significant at 5%. This means that when the rent seeking (measured here by corruption) increases, social expenditure decreases. This result is in line with Buchanan's (1962) thesis, which states that politicians are not intended to be of any general interest, they follow their personal interest, which is the growth of power. This result shows the important role of corruption in public spending during the election period.

The first assumption is verified, there is an EBC for social expenditure.

The results of the regressions when the dependent variable is tax revenue.

The sign of the coefficient of the variable election is negative and significant at 5%. This confirms the theory that during the election period, governments reduce taxes. The existence of the EBC is proven for tax revenue.

The variable rent seeking is positively significant at 5%. This means that the tax revenue decrease when rent seeking increase. The results show us the privileged place of the rent, for the governors, during the electoral period. Significant decisions regarding tax revenues and social expenditure are based on rent seeking. These results confirm the thesis developed by Wittman (1977) and Calvert (1985). Politicians do not only care about winning the elections but also act for their personal interests.

When the dependent variable is research and development expenditures, the lagged variable of the research and development expenditures and the variable election are not significant.

The coefficient associated with the rent seeking variable is negative and significant at 10% and that associated with the effectiveness variable is positive and significant at 5%. The corruption and the government effectiveness have respectively a negative and positive impact on the research and development expenditures.

The unavailability, for the moment, of data does not allow us to verify the existence of the partisan EBC in SSA. These data should be disaggregated data on expenditures (social, research and development) and tax revenues for each ethnic group and for each religion.

³ Nordhaus, 1975, MacRae, 1977, Drazen, 2001, Alesina, 1987, Kenneth and Silbert 1988, Rogoff and Silbert, 1988.

3. Recommendations

The results lead us to make economic policy recommendations at the institutional level.

Institutional constraints

The existence of the EBC for social expenditure, tax revenue and the place of rent seeking during the electoral period open a window to the quality of economic rules applicable to public authorities. A normalization of public action that can prevent politicians from the manipulation of fiscal policy variables for their re-election. Economic constitutionalisation could put an end to the opportunistic management of fiscal policy by the rulers.

The major role of institutions in a society is to reduce SPI by establishing stability. The overall stability of an institution can help the poor people to develop themselves (North, 1990). The stability of the institutions contributes a lot to the economic development of the country. It increases private investment, economic growth and social cohesion.

For Kydland and Prescott (Nobel Prize for Economics in 2004), governments owe their discretionary powers to rules codified by laws and treaties. To solve the temporal incoherence of economic policy decisions, the government must commit to its credibility by establishing rules of conduct that it must respect. These economic norms must be inflexible, binding and imposed on political leaders themselves.

These institutional constraints could be the strict respect of the law of finance voted by the parliament, a transparent management of the budget of the country in terms of revenues and expenditures, the control of the inflation (to fix a canvas to the inflation) , the limitation of the public deficit and indebtedness, the punishment of corruption.

These measures increase political competition, reduce rent seeking and enable more effective economic policies.

For institutional effectiveness to be effective, the independence of the executive, judicial and parliamentary branches must be a reality.

CONCLUSION

Our research focused on the existence of opportunistic and partisan EBC in the 47 SSA countries of our sample, from 1990 to 2019. The majority of the work done on the EBC concerns the United States of America. In developing countries, most of the results found are opportunistic EBCs.

We estimate a dynamic panel model with the GMM of Blundell and Bond (1998) for three variables: social expenditure, research and development expense and tax revenue.

Our econometric results show the existence of an opportunistic EBC in the case of the variables social expenditure and tax revenue. During the election period, leaders increase social expenditure and decrease tax revenue because these decisions have positive incidents on their re-election in the election year. The coefficient of the regression with the variable research and development expense is not significant.

Among the variables considered, rent seeking appears to be the most important variable which guides the decisions of the countries in terms of fiscal policy during the election period.

The present research work cannot claim to have exhausted its subject. It conceals a certain number of insufficiencies which contribute to make it perfectible. Among these shortcomings we have not been able to verify empirically the existence of the partisan EBC in the 47 SSA countries that constitute our sample. This is due to the unavailability of disaggregated data on expenditure (social, research and development) and tax revenue for each ethnic group and religion.

Another shortcoming is the non-use of the budget balance and government spending variable for data availability issues.

Further research on this subject could be carried out, in particular through research on the political-economic cycle, in the countries of our sample, which would take into account both the budgetary and the monetary aspects.

CHAPTER III

FISCAL POLICY AND INCOME INEQUALITY IN SUB SAHARAN AFRICAN COUNTRIES

"Imagine a society with perfect economic equality.... As a result, no one worries about the gap between the rich and poor, and no one debates to what extent public policy should make income redistribution a priority.... The society enjoys not only perfect equality but also perfect efficiency."

Gregory Mankiw, (2013, p.21).

INTRODUCTION

The high level of income inequality of SSA countries need to be reduced. Fiscal policy could be used to reduce this inequality. SSA having chosen democracy as political system, what could be the contribution of democracy in the reduction of income inequality by fiscal policy?

The growth advantage since 2000 in Africa has not yet been widely shared. Out of the ten fastest-growing countries in the world, six are in Africa. This growth rate is rebounding from 1.4% in 2009 to 3.4% in 2019 (World Bank, Global Economic Prospects, 2019). This performance does not contribute significantly to income levelling or wealth redistribution. Poverty fell only 8.0% between 1990 and 2015 compared to the 28.3% forecast. Today, about half (50%) of the population in SSA lives with less than \$ 1 a day. The continent has the highest rate of extreme poverty in the world.

Africa is the second most unequal region in the world after Latin America and the Caribbean. In all African countries, the richest people earn the lion's share in term of income (AfDB, 2012): 60.8% of the population is poor and 10.8% share 78.5% of total income.

Facundo et al. (2018) in World Inequality Report warn that "global income inequality will also increase if countries prolong the income inequality path they have been on even with relatively high income growth predictions in Africa, in the coming three decades".

Given this very high level of inequality, Africa could experience a social, humanitarian and economic crisis caused by inequality. To avoid such a scenario for Africa¹, it must reduce its income inequality.

Reducing inequality eliminates social costs. Greater equality reduces the frustration of the underprivileged classes. The fight against inequality promotes autonomy for the benefit of all and allows the efficient allocation of resources (Gupta et al., 2014).

Jim Yong Kim, President of World Bank Group argue in 2016 that "more equal countries tend to have healthier people and be more economically efficient than highly unequal countries. And countries that invest smartly in reducing inequality today are likely to see more prolonged economic growth than those that don't".

¹ "The Great Depression starting in 1929 and the Great Recession starting in 2008. A striking and often overlooked similarity between these two crises is that both were preceded, over a period of decades, by a sharp increase in income inequality" (Kumhof and Rancière, 2010).

"if rising inequality is not properly monitored and addressed, it can lead to various sorts of political, economic, and social catastrophes" (World inequality report 2018. Page 10).

In order not to have SSA countries suffer the consequences of a high level of income inequality, they must proceed to reduce income inequality.

There are several instruments to influence the distribution of income: the labor market, the goods and services market and institutional reforms. "Fiscal policies are powerful tools to make a dent in income inequality in Africa" (Odusola, 2017 page 154). Fiscal policy is the main tool for governments to influence the distribution of income. It is for this reason that we choose fiscal policy to reduce income inequality through the distribution policy.

Distribution² aims at modifying the primary distribution of income. It mainly has a solidarity function. The purpose of distribution is to reduce inequality as they result from primary distribution. Tax and expenditure policies, social transfers and public services are the main instruments of fiscal policy to reduce income inequality. Fiscal policy has already proven successful in reducing income inequality (Gupta et al., 2014).

Fiscal policy is a powerful tool that changes the income distribution in both directions, up and down. For example, benefits in kind affect market income inequality and taxes reduce inequality in disposable income.³ Redistribution organized by the state helps to ensure cohesion and justice within societies. It helps to protect individuals against various risks (illness, old age, etc.), and to guarantee the poor a minimum income.

Face the crisis of 80s, the SSA countries have opted for the democracy in 1990 in the hopes that it could reduce income inequality to avoid all its consequences.

Democratic institutions are designed to place political power in the hands of the majority. In SSA most voters should be in favour of redistribution from the rich, as the rich are likely to be in the minority. That's why the wave of democratization in Africa in the 1990s has been a hopefulness to reduce income inequality in SSA countries. For Menocal (2017) this positive correlation between democracy, wealth and equality is one of the strongest and most enduring relationships in the social sciences. We expect democracy to lead to inequality reduction, peace, and the stability of the democratic institutions themselves.

As in SSA, around 41% live below the international poverty line (World Bank: Poverty and Shared Prosperity 2018), democracy can contribute a lot in the reduction of income inequality by fiscal policy.

² Gupta et al., (2014) assigns three objectives to fiscal policy: supporting macroeconomic stability, providing public goods, correcting market failures and redistributing income.

³ In Appendix 9, we present the income classification of Lustig (2017).

Chapter III: Fiscal policy and income inequality in SSA

The objective of this chapter is to analyse the contribution of democracy in the reduction of income inequality⁴ by fiscal policy in SSA countries.

We have two sub-objectives: determine the best mix of social, education and health spending and taxes that reduce income inequality. And determine the contribution of democracy in the reduction of income inequality.

Our assumptions are as follows: The SSA countries tax is regressive. The redistributive policy and the democracy increase income inequality between poor and rich people.

The central role of fiscal policy in the fight against poverty and inequality has long been recognized in the literature, but empirical research, particularly in Africa, is limited. Odusola (2017) is one of the few to tackle the subject recently. Our research is therefore a contribution in the design of fiscal policies for the reduction of income inequality in SSA countries.

The vast majority of studies analyse how economic growth can reduce income inequality. Concerning the role of democracy in the reduction of income inequality, our research could be the first that investigates it.

At the methodological level, this chapter makes a main contribution. It analyses whether the reduction of income inequality through fiscal policy is due to the fact that countries are democratic or not. In other words, this chapter checks if the more a country is democratic, the more the fiscal policy of the country reduces income inequality.

This chapter has two parts. The first part is devoted to the theoretical and empirical review of democracy and redistribution and the second part elaborates the methodology.

In the theoretical review, we present the different approaches of redistribution: that of liberals, socialists and Keynesians. Then we present the debate on new approaches to distribution theory (the provident state, the thesis of Amartya Sen and that of Thomas Piketty). Finally, we present the results of the research that focused on distributive policies.

In terms of methodology, estimate a dynamic panel linear model where the dependent variable is the income inequality measured by the Gini index. The independent variables are budget variables (social expenditures, tax revenues), democracy and other.

⁴ Income inequality within a state

I) LITERATURE REVIEW

1) Redistribution policy: theoretical aspect

The theoretical debate on redistribution revolves around several questions among which: is it fair that some individuals receive aid without compensation? Should we let the market and its price system operate freely the redistribution of income?

1.1 Redistribution: a necessity

Morally, redistribution is vital

Redistribution can be classified into two groups, the first in terms of social justice (pure redistribution) and the second in terms of economic efficiency (effective redistribution).

Pure redistribution is a redistribution of income for moral reasons only, it has no objective of economic efficiency. Effective redistribution is based on the idea that income redistribution will create economic efficiency.

The optimal allocation of Pareto resources does not guarantee a better distribution of resources at moral level. This is why social justice demands a redistribution of the wealth from the best endowed individuals towards those who are less rich. For example, it is morally unacceptable for 1% of the world's population to have more wealth than the remaining 99% (Oxfam 2016, online). Ethics and morals (religious, cultural, philosophical) consider such a distribution of income as inadmissible.

Economic redistribution refers to situations where market imperfections create the need to improve the allocation of resources to make the economy competitive. We must therefore redistribute wealth.

These two extreme views of redistribution deserve careful analysis to put in place a more just and effective redistributive policy.

The research for equal opportunities can be achieved by using the law to fight against discrimination. Some social groups do not have, in practice, the same opportunities as others despite the equality advocated by the legislation in force. This is the case of visible minorities, women, the disabled, etc. To restore the equality in term of opportunities, the government can initiate policies to fight against these discriminations. This fight passes by the law which will put in place devices to prevent these discriminations. That is positive discrimination.

The modalities of redistribution

There are several distribution modalities to reduce inequality: Vertical distribution - horizontal distribution; Regressive taxes - proportional taxes - progressive taxes.

Vertical distribution is provided by the state and is based on the principle of assistance. It is a social protection system based on solidarity between citizens, and is therefore financed by taxes. The objective here is to reduce income inequality and promote consumption, particularly through the provision of non-market public services. This redistribution leads to a reduction of inequality.

Horizontal distribution is provided by social protection organizations (such as social security and mutuals) and is based on the principle of insurance. It is a social protection system based on solidarity and is therefore financed mainly by social contributions. The goal here is to protect agents against social risks or events that affect an individual's ability to work and gain during their period of activity.

The tax policy is regressive when the rate is higher for poor people and lower for the richest. The poor pay relatively more tax than the rich when the tax policy is regressive. Thus a regressive tax policy system increases inequality because the differences of income are higher after taxes than before taxes. The regressive tax policy can be considered to attract large fortunes on the national territory.

A progressive tax is a tax whose rate rises as the value of the base value increases. By definition, a progressive tax system reduces inequality, in the sense that income gaps are lower after taxes than before taxes. The progressive tax deters any initiative, any temptation to accumulate income. It also prevents any rise, any increase of capital.

A proportional tax is a tax whose rate is the same for all income levels. We also speak of "flat tax". This is the case, for example, of the VAT whose rate is fixed whatever the value of the transaction. This may be because regressive taxes and progressive taxes offset each other. By definition, a proportional tax system is neutral with respect to inequality: the income gaps are the same before and after taxes.

The debate over the choice between vertical redistribution and horizontal redistribution and the choice between regressivity, proportionality and progressivity remains open. In practice, these policies are applied concomitantly in the countries. Populations or goods and services are targeted by taxes in a specific way. The ultimate goal is to reduce inequality through redistribution.

Keynesian thought Approach

On the economic front, two theoretical approaches consider income redistribution as a tool to support economic growth and to reduce inequality: the Keynesian approach and the endogenous growth theory.

The Keynesian approach (1936) considers that redistribution policy is a tool to support growth. Taking a tax on a high-income households does not reduce their consumption but only the savings. By allocating the amount withdrawn to a low-income household, it increases its consumption, thus reducing inequality. Overall consumption is increasing, which will boost demand for goods and services from businesses. These will produce more, which will create jobs and additional income, thereby enhancing growth.

In this Keynesian perspective of support for global demand, the state can promote consumption during periods of slow growth, thereby contributing to the revival of economic activity. Conversely, in periods of overheating and inflationary pressures, the government can moderate the growth of disposable income and thus stabilize the economy by exerting pressure on demand. Redistribution therefore has a high economic efficiency, this benefits everyone. On the contrary, strong inequality slows down demand and growth.

The theory of endogenous growth (P. Romer, R. Lucas and R. Barro) shows that certain expenditures, especially public ones, can have a long-term growth-enhancing effect.

By investing in public health and education services, the government contributes to the improvement of human capital. Indeed, a well-educated and well-educated workforce has a high level of skills that are competitive advantages in terms of productivity and performance. Redistribution can indirectly affect the competitiveness of an economy. As the economy becomes competitive, it reduces inequality.

The public power must intervene in the market to reduce inequality by ensuring good human capital training for all.

Keynes's interventionist recommendations gradually materialized in the United States and in England in the 1930s. It was the post-war period, with the "Thirty Glorious", which established the effectiveness of active conjunctural policies. It was therefore the prestigious period of redistribution policy in United States and Europe.

However, the opportunity for state intervention in the economy will be largely challenged by the long-lasting crisis of the early 1970s. While redistribution mechanisms have failed to correct inequality, it is for some authors because inequality are essential for the functioning of a market economy.

1.2 Redistribution: an inefficient system

The effectiveness of redistribution is often disputed.

Income redistribution has perverse effects at the moral level.

There is the stigmatization of beneficiaries of the redistribution policy. We will blame them for not having obtained the position they occupy on their own merit. This criticism is even often internalized by those who benefit from the redistribution and they can reject helps. Thus, in the United States black Americans refuse positive discrimination because they want to prove that they can achieve the same results on their own.

A feeling of injustice for those who have been excluded from the scheme and who, however, have achieved better results than the beneficiary populations. This discrimination can undermine social cohesion and republican universalism. Wanting to achieve equality through inequality, we also risk leaving those who do not benefit from their difficulties.

Redistribution make some to be satisfied with a position of assisted. The beneficiary populations are accustomed to state assistance, which would incite them to laziness and inactivity.

The fight against inequality is illegitimate and inefficient

In the classical liberal conception, inequality resulting from competition and the market are just. Individuals are selfish beings who seek to maximize their personal happiness. The "invisible hand" of the market will coordinate all these actions to arrive at an optimal situation (in the sense of Pareto) in which the situation of an individual can't be improved without degrading that of another.

The distribution operated by the market is therefore fair. In this case, the fight against inequality is illegitimate, ineffective and detrimental to freedoms. The state must be satisfied with ensuring equal rights (justice, national defence and police). This is what the authors of the end of the XXth century call good governance.⁵

Income inequality is legitimate and just.

Inequality can be natural. Not all individuals have the same abilities or the same talents. It is therefore "natural" that inequality appear. Even if we give the same opportunities to all, inequality will always appear because all have not the same capacities. The existence of the rich is a powerful factor of imitation.

⁵ Barro (1996), Clague, Keefer, Knack and Olson (1996), Alesina and Perotti (1994), Rodrik (1999).

Redistribution among anti-Keynesians

The idea of refuting the intervention of the state in the economy is old and its modern version is expressed in the current often described as anti-Keynesian or new liberals. The most cited authors are: Friedman and the Monetarists, Laffer and the School of Supply, Lucas and the New Classics, Nordhaus and the School of Public Choices.

Friedman (1970) is the main figure of the monetarist and the leader of the University of Chicago which he will make an "anti-Keynesian bastion". On the one hand, Friedman challenged the Keynesian consumption function by introducing his theory of **permanent income**.

He points out that consumption does not depend on current income, but on permanent income (ie past and future incomes of the individual). There would be no longer a stable relationship between the current income of the period and the consumption of the same period. Thus, the stability of the consumption function, the propensity to consume and the multiplier of Keynes are called into question. The redistribution policy would therefore be inefficient in the short term and destabilizing in the medium term.

For Friedman, government spending financed by public borrowing replaces an approximately equal volume of private spending (including investment). It is the eviction effect.

The economy of supply is a current of contemporary liberalism. Arthur Laffer is considered today as the leader of the **School of Supply**, "Supply-side". He is the author of a curve that bears his name, the Laffer curve, which shows that "**Too many taxes kill taxes**".

Supply theorists insist that the only way for the state to act is to reduce taxes. It is necessary to reduce the burden of compulsory levies on businesses and households to not penalize work and savings. It should also reduce the sphere of intervention of the State and reduce the public debt, both causing the rise in taxes.

An excessive level of compulsory levies could discourage economic agents from investing in wealth creation. Too high tax rate may lead to tax emigration to countries with less "severe" taxes. It is for this reason that liberal economists support proportional taxation. Depleting the rich kills the incentive to invest and innovate (Schumpeter), which will reduce economic growth that could benefit the poor through the provision of jobs and income.

For liberal economists, the savings act must precede the investment expenditure. Anything that can increase savings is therefore useful. Since the savings rate rises with the level of income, to accelerate the accumulation, we must leave a high income to those who are in a position to save.

In the 1970s, the new classics (Lucas, Barro and Buchanan) introduced a hypothesis even more radical than monetarists did: the **hypothesis of rational expectations**. The effectiveness of the stimulus is thwarted by the rational expectations of agents that cancel the effect of the Keynesian multiplier.

During the recovery, agents anticipate tax increases by saving as a precautionary measure. Thus, fiscal policies do not lead to changes in consumption and investment but instead increase savings. Only a surprising policy agents will have an effect on redistribution, and only through the mechanism of supply. This theory was first enunciated by Ricardo (1821) hence his name of principle of Ricardian equivalence (1821) or Ricardo-Barro effect.

Jouvenel (1951) in his redistribution ethic believes that distribution is a process that has led to a huge state bureaucracy. The **bureaucratic state** absorbs much of the resources taken away from middle-class families. Taxes levied by the state reduce the capacity of private investors, so it would be up to the state to take care of the investment (training and maintenance).

Jouvenel notes that redistribution ceases to go from top to bottom and transforms into horizontal flows that benefit some collectives, who sometimes even have higher incomes than the poor. He concludes that the argument of distribution is a false pretext used by the state.

For that, Jouvenel proposes that it would be better to trust the rich and those who have the capacity to become rich to boost the economy and growth. Inequality due to work and merit are positive and do not detract from the poor, they benefit in terms of job creation.

From a "**Hayekian**" point of view (Friedrich Hayek, 1973), no government really knows what a "fair" distribution of wealth is. According to him, the state has no idea how far it should grab the wealth of the wealthy to distribute to the less well off.

For this, Hayek (1960) states that since it is the individual who knows what is in his best interest, and how to pursue them, any attempt to plan the state is bound to lead to suboptimal distribution. So the optimal distribution can only be the result of the free interactions of individuals.

The debate on inequality was renewed in the early 1970s with the publication of **John Rawls's** book "Theory of Justice" (1971). Like Hayek, he starts from the fundamental postulate that justice cannot be achieved without the simultaneous respect of equality and freedom.

A just democratic society must therefore be based on three principles: Freedom, equal opportunities and finally the acceptance of difference. Inequality coming from such system is acceptable.

1.3 New challenges of the redistribution policy

The beginning of this century is marked by new challenges of redistribution policy. We summarize them in three groups: the crisis of the welfare state; Amartya Sen's approach and Thomas Piketty's thesis.

The crisis of the welfare state

The crisis of the welfare state can be exposed in two points: the crisis of efficiency and the crisis of legitimacy. Countries have experienced economic crises after a strong economic expansion. During their glory years⁶, these countries had large financial margins. This allowed them to cope with different social benefits. With the various financial crises that followed, the need for social assistance increased (mainly due to unemployment) and government revenues declined considerably. The welfare state thus loses its effectiveness.

The legitimacy crisis of the welfare state stems from the fact that the current social needs are no longer the same as when the welfare state developed. In this new economic context, the social protection system appears to be unsuited to the new challenges of the economy. Globalization and the migration crisis (in Europe, America and Africa) challenge the legitimacy of the welfare state.

On top of that, the cultural model is no longer the same. The values of caring, community and solidarity are disappearing. We are moving towards more and more values about individualism where everyone is concerned about respect for their rights. Nobody wants to contribute and participate in national solidarity. Hence the loss of the legitimacy of the welfare state.

This crisis of welfare state effectiveness is therefore linked to social change and the economic context.

The thesis of Amartya Sen

Amartya Sen has developed a new theory of social justice that can be understood as an overtaking of John Rawls' theory of justice (2009). Unlike the latter, Sen's goal is not to establish a just and perfect society. We must reduce injustices and improve justice in a democratic and international environment. Sen argues that inequality are just as long as society has offered every means to self-realization. In "inequality reexamined" (1992), he considers that a just society must first allow all its members to choose their destiny. It must offer the same set of "capabilities". This concept corresponds to the formal and material freedoms that give an individual the ability to achieve the kind of life he wants.

⁶ For the countries of Europe it was the period of the thirty glorious post-war and for the African countries it was between 1960 and 1980.

According to Sen, identical rights cannot suffice to constitute "justice based on capability". All men are different and equal rights do not translate into the same freedom for everyone. Therefore, social justice consists of giving all individuals the same freedoms, the same rights, but also equal freedom of access to external means and personal abilities by which a person can exercise his freedoms. The claims of individuals should not be judged on the basis of the first things they hold respectively, but on the freedom they really enjoy in choosing the life they want to value. It is this real freedom that Sen calls the "capability" of the individual to perform various possible combinations of functions.

It should not be confused (the "capability") with the possession of primary goods (and other resources). Two people with the same "capability" can choose different operations because of their particular objectives; even with the same goal, they can achieve different results because they can use their freedoms differently.

"Capability" reflects the freedom of an individual to choose between different possible lives and to achieve the one he deems worthy of being conducted. A society is therefore all the more just that it allows each of its members to accomplish the objectives it gives itself.

Equalizing income is not the end goal, because not everyone converts income into well-being and freedom in the same way. The ultimate goal is that the individual has the necessary means to realize himself. Amartya Sen's capacity framework has introduced a new way of thinking about human well-being. Fiscal policy can help to achieve the capability.

The thesis of Thomas Piketty

Thomas Piketty (1999), in "Essais sur la théorie de la redistribution des richesses" suggest "the introduction of a progressive tax on the capital" to face this new wave of inequality of the end of the XXth and the beginning of XXIst century.

To allow those who have nothing to access a heritage and thus go beyond, in a peaceful way, the contradictions related to the influence of the inheritance and very high patrimonies on society. Otherwise this contradiction will be solved by violence. This is why, in addition to a tax on high income up to 80%, Thomas Piketty (1999) proposes the introduction of a progressive capital tax.

According to Piketty (1999), progressive taxation is very effective in reducing income inequality. This Piketty thesis is widely presented in "Capital in the Twenty-First Century". Taxing capital, therefore, not to take revenge on the wealthiest, as some fear, but to prevent the highest assets from progressing, structurally, three or four times faster than the economy. This keeps the wall economy under control.

Chapter III: Fiscal policy and income inequality in SSA

The hope of basing wealth on merit alone remains strong in Piketty. There is a clear gap between those who own capital and others. In a democracy, however, giving meaning to inequality is vital: they are acceptable only if they are justified, if they are necessary for the benefit of all.

The author also makes a criticism of capitalism. In his opinion, the forces limiting inequality and naturally bringing societies back to "balanced growth paths" are not effective. Unbalanced forces can easily win. The price system knows neither limit nor moral. Without a vigorous revival of the situation of income inequality by political power, capitalism jeopardizes the meritocratic values that are at the foundation of modern democracies.

For Piketty, if the wealth is very unequally shared, the demand for capital will be stronger than the supply and the interest rate will be higher. In this case, the accumulation of capital is less strong and it reduces production and growth.

Equality of opportunity exists when the results of life depend only on the factors for which people can be held responsible, and not on the unfavourable attributes beyond their control. He argues that sex, ethnicity, family history ... should not determine these results.

To reduce income inequality, everyone must appropriate the economy: we are all concerned, concluded Thomas Piketty (1999).

This theoretical debate on the necessity of redistribution to reduce income inequality is important for SSA countries. These countries present some specific characteristics: the high level of income inequality and poverty; the informal economy and the traditional agriculture.

It is difficult to insert the informal economy in any form of official statistics, oversight, taxation and regulation. According to the ILO, the informal sector in SSA makes up nearly 86% of all employment. The informal economy limits productivity and growth. The risk for people to lose their job is high and these jobs are not covered by the social security. The informal economy is a big issue for the poverty and income inequality in SSA. Over 60% of the population of sub-Saharan Africa depends on agriculture for their livelihood. And the agriculture is not modernized, farmers still use archaic methods of farming. The productivity and the products prices are very small and volatile.

These specificities of the SSA country economies make poor people more vulnerable. The intervention of governments to reduce income inequality and poverty to protect poor people is a necessity for SSA countries. The Reducing Inequality Index (CRI) developed by Oxfam and Development Finance to produce a ranking of African countries on their policies to reduce the gap between rich and poor shows that it is possible for African governments to choose a path of more equitable growth.

2) Fiscal Policy: Inequality and Poverty

Income inequality remains a fundamental question in the design of an effective fiscal policy. There is little studies that have estimated the impact of income redistribution on inequality and poverty in SSA.

2.1 Fiscal Policy and Inequality

The authors agree that the redistributive impact of fiscal policy in developing economies is severely restricted. This is due to the levels of taxes, transfers and subsidies that are low.

Oduola (2017) notes that when average tax rates for advanced economies exceed 30% of GDP, the ratios of developing economies are generally between 15% and 20% of GDP. As a result, expenditures are also much weaker.

In addition to having low social expenditures, the economies of the developing countries allocate a relatively lower spending on social transfers. This greatly reduces the potential for redistributing their fiscal policy. Countries with high tax revenue tend to have lower poverty rates. Indeed, tax revenue alone tends to account for 16.5% of poverty reduction in developed countries (the OECD countries and the United States of America).

How can we be sure that what the poor pay in taxes returns to him under transfer form? Oduola (2017) discusses the important role played by institutions in budget management in Africa. Increasingly participatory (civil society is associated to the management of taxes and transfers), countries transparent better reduce poverty and inequality.

In most SSA countries, the amount of taxes paid by the poor people is so high compared to the transfers they receive that poor people become poorer. Recently the link between poverty and the taxes used to reduce them were discussed in the debates on Post 2015 Sustainable Development Goals of the United Nations. Keen and Lockwood, (2010) also addressed this issue. It is the poor who pay the most taxes, so they are more impoverished by the tax policy. The regressivity of taxes can be responsible of this phenomenon.

Higgins and Lustig (2016) find that in ten out of seventeen countries studied, at least a quarter of the poor people pay more taxes than they receive from transfers. That's why in Guatemala, one of the most unequal countries in Latin America, fiscal policy does very little to reduce inequality and poverty (Maynor et al., 2014).

The level of taxes must not annihilate the effect of the distribution.

Musgrave (1959) has shown that fiscal policy can play an active role in achieving an equitable distribution of income within households.

Although taxation is presented as an inefficient tool for redistribution, Gupta et al. (2014) show that direct taxes on incomes and transfer schemes reduced the average Gini coefficient by around one-third in OECD over the period 1985-2005.

Taxation plays an important role in achieving greater equity in the distribution through the progressivity of the tax policy and generating sufficient income to finance public spending on social programs.

Fiscal policy affects poverty and inequality through progressive tax, well targeted transfers and quality pro-poor spending. For Odusola (2017), the tax burden must be borne by the rich and public spending must be geared towards the poor and marginalized groups. It's the best way to reduce poverty and inequality. Well-targeted public spending for education, safety nets reduce poverty and inequality substantially.

Fiscal policy must be used to influence structural factors affecting poverty and inequality. This is particularly accumulation of human capital, factor endowment and market job transformation. Lustig (2017) wants the poor people, especially extreme poor people, to be recipients of tax resources so that they can consume minimum quantities food and other essentials.

The results of studies regression suggest that high social benefits reduce inequality. Most studies provide evidence that direct taxes are more distributive than indirect taxes and social protection reduce inequality better.

At the same time, these studies find that some social benefits expenditure (such as social assistance) do not always reduce inequality. This is due to poor targeting or misuse of these expenditures (Chu, Davoodi and Gupta, 2004, Ospina, 2010; Martínez-Vázquez, Vulovic and Dodson, 2012). The choice of fiscal policy variables and how to use them is imperative for the reduction of inequality.

High levels of inequality also hindering poverty reduction in many African countries (Fosu, 2014). That is why more attention must be given to reducing inequality in SSA countries. Once the inequality are reduced, it is easier to tackle the issue of poverty.

Jon et al. (2016) find that between 1992 and 2012, Uganda halved the proportion of people living in poverty however income inequality has risen sharply during the same period. Lustig (2017) finds that when fiscal policy was reducing inequality in twenty-five countries in 2010, this was not the case for poverty.

2.2 Effectiveness of fiscal policy

The efficiency of income distribution depend on many factors, including fiscal policy instruments: tax, transfer and public spending.

Lipton (2014) brings together all approaches to improve the effectiveness of distribution policy in four points.

First, the redistributive fiscal policy must be consistent with the objectives of the macroeconomic policy. The level of redistribution expenditure, for example, must be consistent with macroeconomic stability. The benefits of additional spending on redistribution should be compared to the benefits of increased spending in other priority areas, such as infrastructure.

Secondly, taxes and expenses must be assessed jointly. Thirdly, redistribution must strengthen human capital to improve efficiency. And fourth, the design of redistribution must take into account the administrative capacity.

The author states that these measures could be implemented in the framework of long-term budgetary objectives to more effectively achieve the objectives of redistribution. They could also be included in the design of fiscal consolidation strategies to help governments achieve redistributive goals at a tax cost inferior.

Many countries are deepening their direct taxation, while some are moving from indirect taxation to direct taxation as a means of reducing income inequality.

The growing wave of public participation in budgeting and the introduction of matrix of social accountability in service delivery at the country level is also a factor that stimulates distributive efficiency. Kenya is one of the countries in SSA who started this experience of participatory fiscal policy.

For effective budget redistribution, the impact of fiscal and spending policies on redistribution should be evaluated jointly. Tax and Expenditure Policies must be carefully designed to balance distribution and efficiency objectives. Fiscal policy can also promote equal opportunities and greater intergenerational mobility.

In total, regardless of the degree of redistribution that governments choose, this should be done with fiscal policy instruments that achieve their redistribution objectives at a minimum cost for economic efficiency. Therefore, the correct selection of the composition and combination of these policies has become a crucial importance in the goal of achieving a broad economic growth path. Expenditure and the tax policy must be structured efficiently to reduce income inequality and poverty in SSA countries.

3) Democracy and income inequality

We present in this part the theoretical and empirical researches concerning the impact of democracy on income distribution.

3.1 Democracy reduces income inequality

The seminal paper regarding the capacity of democracy to reduce inequality is Meltzer and Richard (1981). Democracy is supposed to give the power to the majority. So when we have a population composed in majority by poor, the democracy will give them the possibility to take decisions. These decisions will naturally be policies regarding the redistribution to reduce poverty and inequality. That's why democracy is considered as a political system which reduces income inequality.

The instruments generally used for the distribution in order to reduce inequality are taxes and social expenditures. The tax policy is progressive so that the contribution of rich to the expenditure of the government is higher than the poor people contribution. But the social protection is, in majority oriented to the poor.

Felipe (2016) underline four mechanisms through which democracy could breed more egalitarian societies.

One mechanism is that democracy allows labour unions to obtain centralized wage bargaining and minimum wages which reduce wage dispersion. Another mechanism is that democracy guarantee broad access to property rights. The poor could use them for financial transactions. The third mechanism suggests that democracy makes governments to invest more in public services, such as education. Education, in turn, acts as a redistribution channel reducing the dispersion of human capital and increasing a generation's human capital relative to the previous generation. The last mechanism, the most important, is the median voter theory.

This theoretical positive impact of democracy on income inequality is based on the median voter theory. According to that theory, in unequal societies like SSA, the median voter who is the individual with the median level of income is poor. He will prefer progressive taxes, transfers from the rich to the poor and social spending in direction of poor. When we are in a democratic system, it is the choice of the median voter who win the election and the distribution policies are applied. So the median voter hypothesis provides ability to the democracy in unequal countries to redistribute a greater proportion of income.

Democracy can be disturbed in its application by the elite. It brings democracy not to reach one of its goal which is the reduction of inequality. The fear for the rich, (generally they are in the power) to finance the redistribution because of the higher taxes during the democracy brings these riches to take actions.

"The rich elite can undertake costly investments to increase their de facto power⁷" Acemoglu et al. (2005).

In Africa, it can take the form of investment in their own tribe, region, religion or ethnic. One of the specificity of SSA countries is that one is more linked to his tribe, region, religion or ethnic than to the rest of the nation. For a normal person, he is first member of his tribe, region, religion or ethnic and after member of the nation. So he will fight to enrich first his membership prior to enrich the nation. During the elections, the candidates are sure that the members of their tribe, region, religion or ethnic will vote for them. The rich elite uses this aspect of the specificity of SSA countries to increase their facto power in order to not distribute their wealth. Another way used by the richer on power to avoid the distribution of their income during democracy in SSA is to make a semblance of distribution. The number of extremely poor people in SSA is very high (Barne and Wadhwa, 2018, World Bank)⁸. The power make a semblance of distribution giving the population just a few of their wealth. This part of the revenue is small so that it doesn't change the income of the rich. But people are so poor that they increase the de facto power of the rich in exchange of this semblance of distribution. The consequence is that although we are in a democratic system, inequality doesn't decrease.

The use of the law can also be a cause of inequality under a democratic system. Lot of constitution of SSA countries are criticized because they give too much power to the executive and the population hasn't the possibility to give his opinion. The law doesn't allow to make demonstrations. The press is not free and the access to the public media is not free. The elite excludes the poor from the political decisions to keep and increase their de facto power. The power writes the constitution, makes the laws that are in his father and in father of the elite. The poor population is removed from the political decisions.

For all these raison, Rocha Menocal (2017) concludes that democracy does not automatically reduce inequality.

⁷ The power they control outside those institutional. For example their influence on parties' platforms via lobbying or repression through control of local law enforcement.

⁸ By 2030, forecasts indicate that nearly 9 in 10 of the extreme poor will live in Sub-Saharan Africa.

3.2 Other political system can also reduce income inequality

On this line, we expect non democratic political systems, that's mean political systems which concentrate political power within a narrow segment of the population, to increase income inequality. These political systems are for example: the dictatorship, the apartheid, the racial segregation, the communist, authoritarian, autocratic and feudalism regimes.

At theoretical level, this point of view is not shared by all authors. Some authors sustain that "authoritarian governments are likely to be more successful than democratic governments in promoting equitable development" (Beitz, 1982 page 160). Beitz thinks that authoritarian regimes are better able to protect the interests of the poor. The recent development history in countries of East Asia and East Europe justify this point of view.

From 1947 to 1987, it is the martial law which was lifted in Taiwan. The implementation of land reform (1949-1953) and economic reforms (1950s; 1960s) have been responsible of Taiwan's economic success during that period. Chan and Clark (1994) underline that the island has also a remarkable record in terms of income equity from 1947 to 1987. It still has a more equitable income distribution than many developed countries such as the United States of America.

From 1948 to 1987, South Korea was under an authoritarian regime. In a working paper of the World Bank, Renaud (1976) indicates that since the early sixties the Korean economy has performed remarkably well by international standards and income inequality in Korea does not appear to be greater than in developed countries; in fact inequality appears to be less. Compared to countries with similar levels of per capita income Korea has certainly much less inequality. In East Asia, although countries are not democratic, they succeed to have a good level of income equality. It is the case of Taiwan and South Korea

There is also the case of East Europe countries which were communists and since 1989 have chosen democracy regime. These countries, since they have chosen democracy, have seen their with-in inequality grows. The highest increase in income inequality in European Union (EU) countries are countries of Eastern Europe particularly Bulgaria and Poland (EU statistics agency Eurostat).

We can also mention the case of Malaysia and Singapore. In 1970, the Gini coefficient of Malaysia was 0.51 and in 2014, it was 0.41. In Singapore, the Gini coefficient move from 0.44 in 2007 to 0.40 in 2016. These countries, although being socialism and communism, have succeed to reduce income inequality through redistribution policies.

3.3 Empirical results of the impact of democracy on income inequality

The empirical results show that the debate on the impact of democracy on inequality remains opened. Some researchers find that democracy decreases inequality, others find that democracy has no effect, and several researchers think that democracy increases inequality. The most recent paper which have done a large summary of this literature is Acemoglu et al. (2015).

Bollen and Jackman (1985a) present the first authors who have sustained the positive impact of democracy on income inequality. Aristotle affirms that "in democracies, the poor have more sovereign power than the men of property because they are more numerous and the decisions of the majority prevail" (Aristotle, *The Politics*, p.237). After Aristotle, this argument⁹ has been made with great force by Stuart (1862). The same argument has been refined by Lipset (1960).

Alesina and Rodrik (1994) and Persson and Tabellini (1994) using the model of Meltzer and Richard (1981, 1983) find a decrease in inequality over time as the voting franchise is expanded. An important study done by Rodrik (1999) presents evidence from a panel of countries that democracy is associated with higher real wages and higher labour share in national income.

Islam (2016) finds that freedom reduces inequality only in democracies. If the freedom level in a country 5 years ago were 1% higher than another, its income inequality will be 1.33% lower than the other. He tests it on data for 83 countries using the General Method of Moments.

Some authors have proven that democracy has no relationship with income inequality. (Bollen and Jackman 1985a).

Bollen and Jackman 1985a, using 2SLS and a new weighted 2SLS procedure, find no evidence of direct effects of political democracy on income inequality. Weede (1992) estimates that it is not easily possible to establish the significance of this relationship.

Simpson (1990), using a panel data of 62 countries in the period 1962-1975, argued that income inequality rises with democracy up to some level of democracy and then declines. For him Democracy has a curvilinear relationship with income inequality. Felipe (2015) finds the same result with pseudo-panel data built from nine Latin American countries' household surveys (1995–2009, biannual): inequality first increases with the stock of democracy before falling.

⁹ By reducing inequalities in the distribution of political power, democracy helps to reduce inequalities of wealth and status.

Democracy does not automatically reduce inequality

One of the earlier important paper which proof the negative impact of democracy on inequality is Perotti (1996). Acemoglu and Robinson (2000) proof this negate relationship between democracy and income inequality in Europe during the nineteenth century and in Latin American during the twentieth-century.

Chang (2007) examines the effect of democratization on income inequality in third-wave democracies. He attempts to explain why income inequality has risen sharply in almost every third-wave democracy (especially countries in Latin America, Eastern Europe, and Africa) because one should intuitively expect a reduction in inequality when a country moves from an authoritarian regime to a democratic system. For him, it depends on the patterns of democratization and the consequences of corruption. The author point out that although the presence of democracy, we have a total of 23.4 % increase of the Gini coefficient in Africa between the two decades, while on average Western European countries only witnessed a 6 % increase in Gini coefficients.

Gradstein et al. (2001) estimate that this negative effect is through the social context and societal values within which democracy takes place and through the type of democracy system (parliamentary systems are more likely to generate lower inequality than presidential systems). Menocal (2017) point out that the relentless pressure to win elections in democracies can limit government officials' ability to make tough decisions that might be necessary for a redistributive development strategy.

Timmons (2010), using the University of Texas Inequality Project and the United Nations Industrial Development Organization (UTIP-UNIDO) data set, finds that democracy does not dampen wage dispersion between industries.

According to Gradstein et al. (2004), the existing empirical evidence on the impact of democracy on income inequality can be divided into two broad groups of studies, which are distinguished by their proxies for democracy. One strand of the literature associates democracy with voting franchise. Another strand of the literature conceives of democracy in terms of civil liberties and political rights.

We can conclude that the statistical evidence on the effect of democracy on income inequality is mixed "yet democratic regimes' ability to perform—both economically and socially—remains mixed at best" Rocha Menocal (2017).

What is the best political system to reduce income inequality in SSA countries? What is the contribution of democracy in the reduction of income inequality by fiscal policy in SSA countries?

II) METHODOLOGY

To analyse the contribution of democracy in the reduction of income inequality by fiscal policy, we use a linear panel model with which we make different regressions. Statistical and econometric studies (stationarity, cointegration and specificity tests) allow us to make unbiased estimations.

1) Model

1.1 Econometric specification of the model

The sample is composed of 47 countries of SSA. We gather these countries in five groups taking the origin of the colonizer as reference.¹⁰ The colonizers are: The Britain with 18 colonies, the France with 16 colonies, the Portugal with 5 colonies, the Belgium with 3 colonies and the last group is composed of four colonizers (Spain, Ethiopia, United States and South Africa) who has colonizes respectively Equatorial Guinea; Eritrea; Liberia; and Namibia. Ethiopia hasn't been colonized.

The criterions we use to attribute a colonizer to a colony is the last colonizer who have brought the country to the independence. The well-known example is Germany with its colonies he lost after the first world war: Cameroun, German East Africa (Rwanda, Burundi and the continental portion of Tanzania), Namibia, Togo and the east of Ghana. These colonies became colonies of Britain, Belgium and France. The lack of data doesn't allow us to estimate the contribution of democracy in the reduction of income inequality by fiscal policy for each group of colonies.

1990 as a determined year in the process of democratization of SSA countries

The mutations of the Soviet Union and Eastern Europe following the end of the cold wars in 1989¹¹, the crisis of single party regimes, the rise of liberal democratic demand in the one hand and in the other hand the devastating effects of the economic crisis and the programs imposed by the international financial institutions during the years 90s have been the determining factors for the accession of most SSA countries to democracy.

1990 is an important date for democracy in SSA. It is during this period that most of the countries of SSA after lot of years of single party and dictatorship adheres to political pluralism, multiparty politics, freedom of expression and the state of law.

¹⁰ The table 18 which shows these five groups is at the annex 1. In the same table 18, we have put the date of the independence of the each country.

¹¹ During the 16th Conference of 37 African countries and France which took place in La Baule, France, on June 20, 1990, the President François Mitterrand argued that development rhymes with democracy and that French aid would now be towards SSA countries that opt for democracy.

The consequences of this atmosphere of 90s are numerous: (1) The alternative took place at the end of democratic consultancy (Kenneth Kaunda, in Zambia, 1991; André Kolingba in the Central African Republic, in 1993; Didier Ratsiraka, Madagascar, 1993) or following national conferences (Mathieu Kérékou, Benin, 1990; Denis Sassou-Nguesso, République of Congo, 1991; Ali Saibou, Niger, 1991-1993). In some countries, the power changes hands by force (Chad), even during a bloody civilian wars (Liberia).

(2) Multiparty system is established in lot of countries (Togo, Guinea, Ivory Coast, Cameroon, Senegal, Mauritania, Gabon, Democratique Republique of Congo, Kenya, Tanzania).

(3) In South Africa, Nelson Mandela is free in 1990 and during the same year, Namibia gains independence.

As we note in these examples cited, the adoption of democracy by SSA countries is not linear, each SSA country goes at its own rhythm. However, we could retain the year 1990 as a determined year in the process of democratization of SSA countries.

The period from the independence to 1990 is considered as the period of single party, authoritarian regime and dictatorship. The period from 1990 is consider the period of the democracy. The period of the research is from 1990 to 2018.

The economic literature suggests two approaches to estimate the impact of fiscal policy on income inequality in the presence of democracy: the analysis of tax incidence and the linear model. The analysis of tax incidence¹² uses the difference between the Gini coefficient before taxes and transfers (market incomes) and the Gini coefficient after taxes and transfers ie disposable incomes (Lustig, 2017); or compare the income in the presence tax and transfer policies with income in the absence of these policies. These two approaches have in common the comparison of the real impact and the legal impact of the fiscal policy on inequality. They determine the real impact of fiscal policy and give information on the magnitude of responses behaviour of consumers and producers to taxes and transfers. As the analysis of tax incidence has already been used by Odusola (2017) in the case of SSA countries, so we use the linear model.

¹² This method is described in detail in Lustig and Higgins (2013) and has been applied in several Latin American countries (Lustig, 2017).

The functional form of the model

As argued by Acemoglu et al. (2015 p.1886) "The impact of the political system on distribution depends on the laws, institutions, and policies enacted by that system". We use a linear panel model to assess whether the reduction of income inequality by fiscal policy is linked to the fact that the country is democratic or not. We largely used the model of Acemoglu et al. (2015).¹³ The linear model is in the following form:¹⁴

$$y_{it} = \gamma d_{it-1} + X'_{it-1}\beta + \mu_t + \psi_i + u_{it} \quad (3.1)$$

Table 13 : Variables of the equation (3.1)

Variables		Origin	Description
y_{it} : Income inequality		WIID	Gini
d_{it-1} : Democracy		FHI	Political rights and Civil liberties
X'_{it-1}	Taxes	WDI	Tax revenue (% of GDP)
	Social expenditure		Government expenditure on education, total (% of GDP) and Domestic general government health expenditure (% of GDP)
	GDP		GDP per capita

Where : $i = 1, \dots, N$ are the « individual » (countries).

$t = 1, \dots, T$ is the time (years).

Lags in this specification will always mean 5 years lags: d_{it-1} is democracy 5 years ago.

The description of the variables allows us to understand the theoretical foundations of the model. In economic theory, the number of determinants of income inequality has gone increasing. We do not claim to be exhaustive with respect to the determinants of inequality in this chapter. We retain these variables for different reasons: these variables are the most cited in economic theory; they sit best for the country of ASS and are those for which we have data. The design of the functional form of the model is based on the foundations of the economic theory that we presented in the literature review.

During the estimates, we see the econometric necessity to choose this model if we want to explain the reduction of income inequality by fiscal policy in presence of democracy.

¹³ Since Aidt and Jensen (2013) to Acemoglu et al. (2015) lot of authors have used this model.

¹⁴ The statistics and econometrics tests of the variables and the model are presented in the annex 3.

1.2 Data

The main two variables of the model are: income inequality and democracy. Income inequality is the dependent variable and democracy with other variables specified in X are independent variables. Variables used in this chapter are already described in the previous chapters (chapter 1 and 2).

Tax revenue: Progressive tax policy decrease income inequality. In the model of the policy effects of democracy on income inequality proposed by Meltzer and Richard (1981), an expansion of democracy should lead to greater tax revenues and more redistribution (social expenditure).

Social expenditures: Social expenditures cover cash benefits, goods and services provided directly by the government and social tax cuts. The OECD in the glossary of statistical terms define the social expenditures as benefits composed by cash transfers and direct provision of goods and services. These expenses are supposed to decrease income inequality.

GDP: As Acemoglu et al. (2015) have done, we include the lagged log GDP per capita as a covariate in the model. They sustain that "democracy is much more likely to suffer from endogeneity concerns when the lagged effects of GDP per capita are not controlled for. ... and ... democracy has a major effect on GDP per capita and changes in GDP per capita may impact inequality independently of the influence of democracy on this variable"¹⁵.

Measure of inequality is in log to make interpretation easier and allows the impact of democracy to be proportional to the baseline level.

In the model, the independent variables are lagged by one period (5 years interval) because we expect their impact on income inequality not to be contemporaneous. We chose 5 years because the elections in SSA countries are each 5 years. Concerning the democracy variable, it is lagged to avoid endogeneity problems (Acemoglu et al., 2015).

The lagged variables (Democracy, Taxes, Social expenditure and GDP per capita) and the log of the income inequality and GDP per capita allows to avoid endogeneity issues.

ψ_i 's denote a full set of country dummies and the μ_t 's denote a full set of time effects that capture common shocks and trends for all countries. μ_{it} is an error term, capturing all other omitted factors, with $E[u_{it}|d_{it-1}, x'_{it-1}, \mu_t, \psi_i] = 0$ for all i and t.

¹⁵ Acemoglu et al. (2015) p.1910.

We rely on economic theory and the situation of SSA countries to do these hypotheses.

Table 14: Expected signs of the variables

EXOGENOUS VARIABLES	EXPECTED SIGN
Democracy	-
Taxes	+
Social expenditure	+
GDP	-

Table 15: Summary statistics of the equation (3.1)

Variable	Mean	Std. Dev.	N. obs
Income inequality (Gini)	47.31	10.36	206
Democracy (Political rights and Civil liberties)	36.83	23.56	1.360
Tax revenue (% of GDP)	15.86	7.44	544
Social expenditure: Government expenditure on education, total (% of GDP) and Domestic general government health expenditure (% of GDP)	18.76	5.94	462
GDP per capita	4121.43	5489.81	1,274

The unit root test we conduct for each variable, in annex 3, chows that the variables of the model are stationary at level so there is a short and long run relationship between the variables of the model.

2) Estimations

2.1 Specification tests

One of the first problems that must be solved when working on panel data is that of choosing the model specification. Modelling can be fixed effects (individual effects) and / or random effects (temporal effects) when the sample is heterogeneous; when the sample is homogeneous, it is a pooled model. That's why, before moving to the estimations, we perform specification tests to find out whether specific effects exist or not.

Several strategies make it possible to choose between homogeneous (pooled model) and heterogeneous dimension and how this heterogeneity should be specified (fixed effect and / or random effect). We select a three-step test. We first apply Fisher's test and we apply the Breusch and Pagan test and then we apply the Hausman test. These specification tests and estimations are done with the Stata 15 software.

The specification tests we conduct allow us to see if the principle sample is homogeneous or heterogeneous.

Fisher's test

H₀: Absence of fixed effect

H₁: Presence of fixed effect

The test results are as follows: F test that all u_i=0: F(17, 9) = 8.98 Prob > F = 0.00

We reject the null hypothesis, so there is a presence of fixed effect.

Breusch and Pagan LM test:

H₀: Pooled regression model is appropriate

H₁: Random-effect model is appropriate

The test results are as follows: chibar2(01) = 12.28 Prob > chibar2 = 0.00

We reject the null hypothesis, so the random-effect is appropriate.

We can conclude that the sample is heterogeneous. Economically, the heterogeneity means that each countries (47) of the sample have its own specific characteristics of each other. Econometrically, the heterogeneity means that the coefficients (μ_{t_i} and ψ_i) are not constant.

The Fisher and Breusch and Pagan LM tests show that the fixed effect and the random-effect are both appropriate. But which model is more convenient? The Hausman test allows us to choose.

Hausman test:

H₀: Difference in coefficients not systematic

H₁: difference in coefficients is systematic

The test results are as follows: chi2(4) = 25.29 Prob>chi2 = 0.00

The fixed effect is more convenient.

The more convenient model is the fixed effect. We estimate the model with fixed effect. We also estimate the model with random effect because it is possible regarding the results of the specification tests. This second estimation allows us to make comparisons.

2.2 Estimate of the equation (3.1)

We summaries in the table 16 the results of the estimations of the model with fixed and random effects.

Table 16: Estimate of the equation (3.1)

	Fixed Effect	Random Effect
C	3.43 ^{***} (0.50)	3.36 ^{***} (0.32)
Democracy lagged	-0.01 ^{***} (0.00)	-0.00 ^{**} (0.00)
Taxes lagged	-0.01 (0.01)	0.02 ^{***} (0.01)
Social expenditures lagged	-0.00 (0.00)	0.00 (0.01)
GDP per capita lagged log	0.11 ^{**} (0.04)	0.02 (0.04)
Observations	31	31
Countries	47	47

Standard errors are in parentheses.

***: significant at 1%; **: significant at 5%; *: significant at 10%.

In the fixed effect model, it is the variables democracy and GDP per capita which are significant, the other variables (Taxes, and Social expenditures) are not. In the random effect model, there are two significant variables: the Democracy and the Taxes.

In both regressions, the variable democracy is negatively significant. In the 47 Sub-Saharan countries, the democracy reduce income inequality. This result is in accordance with the economic theory and with our hypotheses. The remarkable fact of this result is that the coefficient of democracy is very low (0.01). It means that democracy reduce income inequality very little.

This small coefficient of the democracy could be explained by the fact that the SSA countries have opted for the democratic regime only since the 1990s. These countries are news democracy. They are learning how to apply the democracy rules. The good application of the democracy needs time. Acemoglu et al. (2001) says that it is in the long term a country succeed to apply the democracy rules very well.

The GDP per capita is positively significant in the fixed effect model. It means that more the SSA countries began reach, more income inequality increase. In these countries, the distributive policies don't reduce income inequality but increase it.

Chapter III: Fiscal policy and income inequality in SSA

The coefficient of the Taxes is significant and positive in the random effect model. In SSA, the tax revenue increases income inequality. It means that the tax policy is regressive. The amount of the taxes is higher for the poor than for the rich. In this case or the rich manage to evade the payment of taxes or it is a state policy to avoid tax evasion. Odusola (2017) confirms that taxation in Africa is mostly regressive, its incidence falls more on the poor than on the rich. Social expenditures and GDP per capita are not significant in the two regressions.

3) Economic policy recommendations

Fiscal policy (social spending and tax revenue), as it is structured, does not allow to overcome the income inequality in SSA countries. To reduce income inequality, fiscal policy needs to be reoriented.

Social transfers and taxes must be well targeted to achieve their goal of reduction of income inequality.

The recent expansion of the "Conditional Cash Transfers: CCT" programmes¹⁶ offers a promising approach to improve the power of distribution of public spending in developing countries. These programmes consist in targeted income transfers to households and are conditioned by the fact that beneficiary households must invest in the education and health of family members.

Social safety nets should ensure that also the poorest benefit from the increasing of wealth. These benefits provide the poor a minimum level of financial protection, food, access to public infrastructure or medical services. Social safety nets contribute to the overpressure of the circle vicious of poverty. (Dabla-Norris et al. 2015).

These programmes are more cost-effective when targeted at the poorest households.

From a fiscal point of view, priority must be given to reducing tax evasion. Tax evasion is a practice that disproportionately benefits those who are at the top of the income distribution. The real losers are the poor (Owuso, Garrett and Croft, 2000).

Efforts to make companies more transparent and to give them responsibility in the payment of taxes could be valuable. In addition to that, a fight effective against the problem generated by the international mobility of capital implies necessarily to take common measures at the international and multilateral levels.

A significant proportion of the income inequality in development countries is explained by the narrowness of tax revenues. The mobilization efforts of resources must focus on expanding tax revenues. This goes through the application of a progressive tax, the payment of taxes by all and the reduction of tax exemptions.

Improving the tax base, ie the increase in tax revenues, allows to increase the capacity of governments to finance regressive transfers.

¹⁶ Such programmes have been adopted in many developing economies, including some African low-income economies, albeit on a small scale. In Latin America, 17 economies are currently operating the CCT programmes. In Brazil and Mexico, these programs reduced the Gini coefficient by one-fifth between 1990 and 2000.

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In the case of SSA countries, the welfare state should not be abolished, it should rather be improved and adapted to the times and to the habits and customs. Because, as Stiglitz says, the welfare state is a real safety net, it helps to reduce the consequences of natural disasters and economic crises. The welfare state can contribute to the reduction of income inequality in SSA. To achieve this end, fiscal policy can serve as an instrument.

Institutions (the state, the government, the donors ...) have an important role to play in the improvement of income redistribution. The principal causes of income inequality are institutional (North 2005, North et al. 2009, Acemoglu and Robinson, 2012). It is essential that institutions is equitable, and respect the fact that all are equal in front of the law.

SSA countries have enjoyed strong economic growth over the last decade. This requires strong states and governments that defend the interests of their populations and are able to improve social policies. It goes through the introduction of safety nets, the provision of quality public goods, and the implementation of regulations to protect the poor from risks associated with globalization (Nissanke, 2015).

These well-done measures can improve the ability of fiscal policy to address income inequality in SSA countries in a democracy regime.

CONCLUSION

The objective of the research is to analyse the contribution of democracy in the reduction of income inequality by fiscal policy in SSA countries. The model is a panel composed by 47 SSA countries with the time period from 1990 to 2018.

We apply a specification test in three steps: The Fisher test, the Breusch and Pagan LM test and the Hausman test. We find that our sample composed by 47 SSA countries is heterogeneous and we apply the fixed and random effect model. The results indicate that the democracy regime reduce very little (1 per cent) income inequality in SSA countries. Regarding the fiscal policy variables (tax revenue and social expenditure), it is only the tax revenue which is significant with the random effect model. The tax revenue increase income inequality so the tax policy is regressive. When the GDP per capita increases, income inequality increases also.

The distributive system in the current state needs to be improved: raising the level of tax revenue and spend resources more efficiently and equitably. Taxes and receipts must be well targeted and the distribution system of SSA countries must take into account customs and traditions of African countries. Fiscal policy plays an important role in reducing poverty and inequalities through taxes, transfers and public spending. These instruments are needed to reduce poverty and inequality so that everyone benefits fruits of economic growth.

In SSA, the issue of income inequality is closely linked to poverty. To be efficient, the reduction of income must be accompanied by the reduction of poverty. It is therefore necessary that further research be carried out on the relationship between fiscal policy and poverty reduction in SSA countries.

GENERAL CONCLUSION

"Highly unequal societies are less likely to consolidate democracy, and may end up oscillating between regimes and suffer substantial fiscal volatility."

Acemoglu and Robinson (2001, p.938).

The issue of Socio-Political Instability (henceforth SPI), income inequality and fiscal policy in Sub Saharan African (henceforth SSA) has become a topic of research of increasing interest over the decade. This is motivated by the military-socio-political unrest, by the many drawbacks of a high level of income inequality and by the major role that fiscal policy plays in dealing with these phenomena.

SPI weakens institutions, promotes corruption, and discourages investment. Income inequality, on the other hand, is the source of social unrest and has negative economic impacts. To overcome this scourge of SPI - income inequality, fiscal policy is proposed. Fiscal policy plays an important role in reducing inequality, thereby it reduces SPI. The problem is that during an election period, fiscal policy is manipulated by leaders for electoral purposes. The research of a fiscal policy that can reduce income inequality in order to reduce SPI is necessary.

The redistribution carried out by fiscal policy is first of all necessary for social, philosophical, theoretical reasons and for questions of human dignity. In addition, income redistribution policy pursues both objectives of protection against social risks and stabilization of the economy.

The determination of an appropriate fiscal policy to reduce income inequality and reduce the SPI is what motivates our research.

To meet the target, we organized our research into three chapters. The first chapter consisted of measuring SPI in SSA countries and showing how income inequality causes SPI. The second chapter is used to determine the impact of SPI on the management of fiscal policy through the Electoral Budget Cycle (henceforth EBC). The third chapter is to determine how fiscal policy variables reduce income inequality in presence of democracy.

To establish the SPI index, we use the Hierarchical Classification on Principal Components (henceforth HCPC) method. The HCPC is the combination of three methods which are: principal component analysis (PCA), the Ascending Hierarchical Classification (AHC) and the Partitioning.

In terms of income inequality, we use the Gini index of the World Income Inequality Database (WIID) version 4. We then linked SPI and income inequality using democracy variable.

The results that we have achieved are that income inequality causes SPI. Democracy is the main cause of SPI.

The EBC used in the second chapter leads to the opportunistic EBC in the case of tax revenue and research and development expenditure. The results show us the privileged place of rents, for the governors, during the electoral period.

Rents (personal profits of leaders from non-productive activities) is the main variable that most determines the EBC. The main objective for which governments manipulate fiscal variables during electoral periods (before, during and after elections) is to increase their rents.

The lack of disaggregated data on fiscal variables according to ethnic groups and religions did not allow us to carry out empirical research on the partisan EBC in SSA.

In the chapter 3, results from the random and fixed effect models indicate that democracy in Sub-Saharan African countries reduces income inequality only by 1 per cent. With regards to the fiscal policy variables, social expenditure is not significant in the fixed and random effect models and tax revenue is positively significant in the random effect model. The implication is that the tax policy increases income inequality, hence it is regressive. The Gross Domestic Product (GDP) per capita is positively significant in the fixed effect model. It means that more Sub-Saharan African countries become reach, more income inequality increases. In these countries, the distributive policies don't reduce income inequality but increase it.

To get out this vicious circle (income inequality, SPI and fiscal policy), we need to be aware. This awareness and involvement must take place at all levels: civil society, politicians and government. Africa would benefit from learning from the successes and failures of the development models that have been tried around the world.

We do not pretend to be exhaustive on this subject that we have addressed (income inequality, SPI and fiscal policy). Several extensions can be done. It will enrich the thematic.

The research for the best political system (dictatorship, democracy, monarchy, parliamentary system, presidential system, etc.) for SSA countries could be deepened. This system which will allow Africa to reduce income inequality, avoid SPI linked and reduce the EBC.

One of our results in the second chapter is the existence of the EBC in SSA countries. It means that in order to be re-elected, the rulers direct their spending in favor of certain groups at the expense of other groups. This could be one of the causes of income inequality. Future research may analyze income inequality as a determinant of fiscal policy. Lack of data has limited our empirical research. Data on fiscal expenditure disaggregated by decentralized communities, tribes, ethnicities and religions will make it possible to verify the partisan EBC. This data will also help to verify how the targeted fiscal variables can reduce income inequality in SSA.

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ANNEXES

ANNEXE 1: The sample of the research

Table 17: All countries in the sample

C	Code	Countries	R	N	C	Code	Countries	R	N
1	AGO	Angola	PRE	5	25	LSO	Lesotho	PAR	5
2	BEN	Benin	PRE	5	26	LBR	Liberia	PRE	5
3	BWA	Botswana	PRE	5	27	MDG	Madagascar	PRE	5
4	BFA	Burkina Faso	PRE	5	28	MWI	Malawi	PRE	5
5	BDI	Burundi	PRE	5	29	MLI	Mali	PRE	5
6	CPV	Cabo Verde	PAR	5	30	MUS	Mauritius	PAR	5
7	CMR	Cameroon	PRE	7	31	MOZ	Mozambique	PRE	5
8	CAF	Central African Republic	PRE	5	32	NAM	Namibia	PRE	5
9	TCD	Chad	PRE	5	33	NER	Niger	PRE	4
10	COM	Comoros	PRE	5	34	NGA	Nigeria	PRE	5
11	COD	Congo, Democratic Republic of the	PRE	5	35	RWA	Rwanda	PRE	5
12	COG	Congo, Republic of the	PRE	5	36	STP	Sao Tome and Principe	PRE	5
13	CIV	Côte d'Ivoire	PRE	5	37	SEN	Senegal	PRE	5
14	DJI	Djibouti	PRE	5	38	SYC	Seychelles	PRE	5
15	GNQ	Equatorial Guinea	PRE	5	39	SLE	Sierra Leone	PRE	4
16	ERI	Eritrea	PRE	5	40	SOM	Somalia	PRE	5
17	SWZ	Eswatini	MON	5	41	ZAF	South Africa	PRE	5
18	ETH	Ethiopia	PAR	5	42	SDN	Sudan	PRE	5
19	GAB	Gabon	PRE	5	43	TZA	Tanzania	PRE	5
20	GMB	Gambia, The	PRE	5	44	TGO	Togo	PRE	5
21	GHA	Ghana	PRE	5	45	UGA	Uganda	PRE	5
22	GIN	Guinea	PRE	4	46	ZMB	Zambia	PRE	5
23	GNB	Guinea-Bissau	PRE	5	47	ZWE	Zimbabwe	PRE	5
24	KEN	Kenya	PRE	5					

Some countries such as South Sudan, Somaliland, St. Helena, Reunion, Mayotte ... were not taken into account in our sample for a problem of lack of data.

Cape Verde, Lesotho and Ethiopia, Mauritius have a parliamentary regime. Eswatini has a monarchie regime. All the other regimes are presidential.

Regarding the duration of the mandate, except Cameroon, which is 7 years; Ghana, Niger, Somalia who are 4 years, all other countries have a term of office that is 5 years.

R : the regime. PRE : the presidential regime. PAR : the parliamentarian regime.

MON : Monarchy. C: country number.

Table 18: SSA countries ranked according to their colonizer

GROUP A: Great Britain			GROUP B: France			GROUP C: Portugal			GROUP D: Belgium		
3	Botswana	1966	2	Benin	1960	1	Angola	1975	5	Burundi	1962
17	Eswatini	1968	4	Burkina Faso	1960	6	Cabo Verde	1975	11	Congo D. R.	1960
20	Gambia, The	1965	7	Cameroon	1960	23	Guinea-Bissau	1974	35	Rwanda	1962
21	Ghana	1957	8	C. A. R.	1960	31	Mozambique	1975			
24	Kenya	1963	9	Chad	1960	36	Sao Tome P.	1975			
25	Lesotho	1966	10	Comoros	1975						
28	Malawi	1964	12	Congo R.	1960						
30	Mauritius	1968	13	Cote d'Ivoire	1960						
34	Nigeria	1960	14	Djibouti	1977						
38	Seychelles	1962	19	Gabon	1960						
39	Sierra Leone	1976	22	Guinea	1958						
40	Somalia	1961	27	Madagascar	1960						
41	South Africa	1960	29	Mali	1960						
42	Sudan	1961	33	Niger	1960						
43	Tanzania	1956	37	Senegal	1960						
45	Uganda	1964	44	Togo	1960						
46	Zambia	1964									
47	Zimbabwe	1980									

There are other origins that are:

GROUP E		
Other (col)		
Colonizer	Country	
Spain	Equatorial Guinea	1968
Ethiopia	Eritrea	1993
	Ethiopia	
South Africa	Namibia	1990
United States of America	Liberia	1847

In the column opposite countries, these are the dates of independence.

C: country number

ANNEXE 2 : SPI

To build the SPI index of our sample, we use the Stata15 software.

We check the correlation between the variables: scoup1 atcoup2 pcoup3 agcoup reboutex
 assassex durable ndeath repress nkill

Table 19: Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) scoup1	1.000									
(2) atcoup2	0.614	1.000								
(3) pcoup3	0.298	0.196	1.000							
(4) agcoup	0.178	0.184	0.243	1.000						
(5) reboutex	-0.007	0.108	-0.181	-0.116	1.000					
(6) assassex	0.223	0.477	-0.039	0.351	0.351	1.000				
(7) durable	-0.281	-0.310	-0.069	-0.208	-0.210	-0.225	1.000			
(8) ndeath	-0.067	-0.023	0.134	-0.080	0.197	0.127	-0.152	1.000		
(9) repress	-0.002	-0.071	0.293	0.006	0.048	-0.023	-0.155	0.878	1.000	
(10) nkill	0.031	-0.047	0.291	0.008	0.029	0.088	-0.186	0.775	0.793	1.000

The most correlated variables are nkill - repress; nkill – ndeath; repress – ndeath.

Table 20: Principal components

Variable	Comp1	Comp2	Comp3	Comp4	Comp5
scoup1	0.136	0.458	0.224	-0.438	0.039
atcoup2	0.129	0.528	0.006	-0.297	0.214
pcoup3	0.244	0.114	0.548	-0.047	0.134
agcoup	0.091	0.316	0.234	0.767	-0.092
reboutex	0.113	0.107	-0.651	-0.092	0.059
assassex	0.166	0.404	-0.349	0.346	0.392
durable	-0.233	-0.288	0.146	0.033	0.870
ndeath	0.516	-0.222	-0.146	-0.013	0.106
repress	0.522	-0.236	0.056	-0.006	0.009
nkill	0.514	-0.186	0.049	0.020	0.028

Variable	Comp6	Comp7	Comp8	Comp9	Comp10	Unexplained
scoup1	-0.112	0.620	-0.310	-0.173	-0.070	0
atcoup2	-0.217	-0.304	0.557	0.341	0.055	0
pcoup3	0.678	-0.342	-0.082	-0.131	-0.077	0
agcoup	0.039	0.379	0.253	0.159	-0.080	0
reboutex	0.645	0.284	0.102	0.177	0.039	0
assassex	-0.153	-0.306	-0.428	-0.318	0.118	0
durable	0.005	0.254	0.082	0.108	0.014	0
ndeath	-0.142	0.028	0.252	-0.292	-0.694	0
repress	-0.066	0.152	0.266	-0.297	0.695	0
nkill	-0.124	-0.023	-0.434	0.702	0.006	0

Figure 4: Eigenvalues after the pca

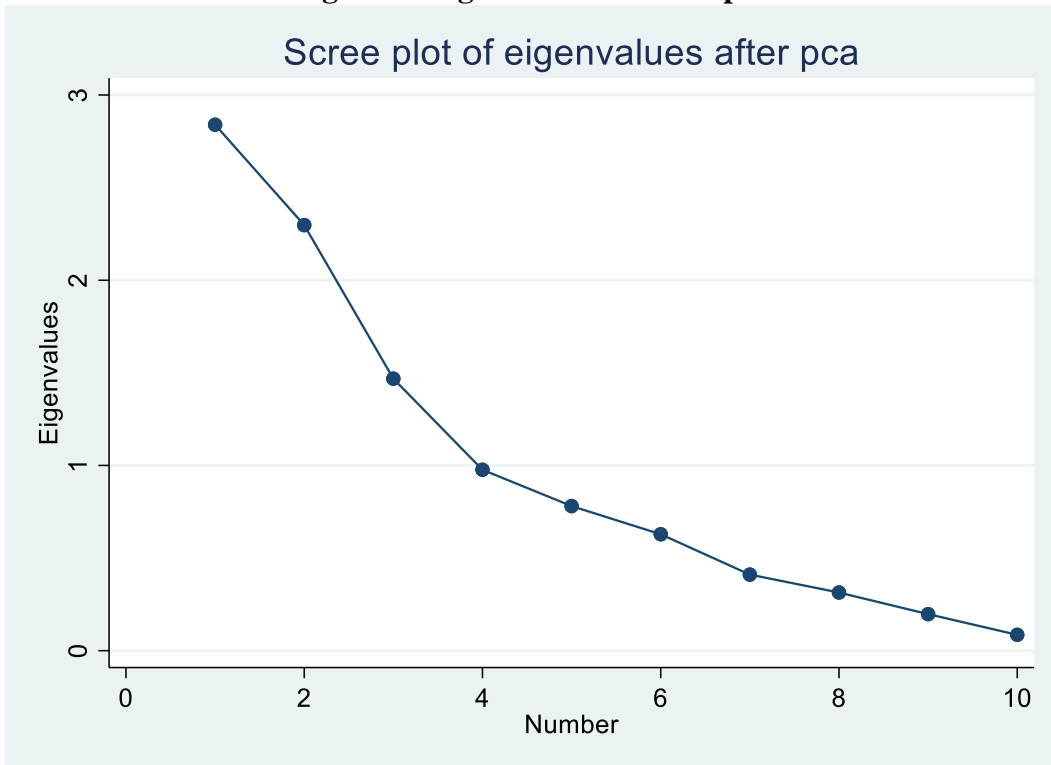
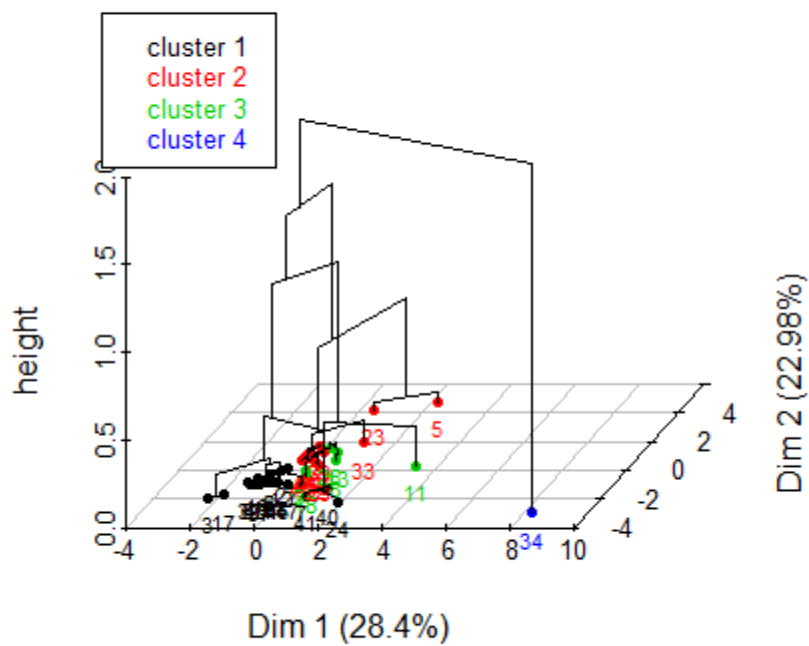


Figure 5: Hierarchical clustering (1990-2018)

Hierarchical clustering on the factor map



ANNEX 3: Statistics and econometrics tests**Tableau 21: Summary of stationarity tests**

	Levin, Lin et Chu		Im, Pesaran et Shin	
	Statistique	Probabilité	Statistique	Probabilité
SPI	-25,54	0,00	-3,44	0,00
Income Inequality	-5,07	0,00	-2,21	0,01
Democracy	-1,31	0,10	-8,88	0,00
Social expenditure	-8,07	0,00	-3,57	0,00
Taxes	-3,27	0,00	-31,15	0,00
Economic Growth	-31,48	0,00	-12,33	0,00
FDI	-9,92	0,00	-33,97	0,00
Urbanisation	-41,30	0,00	-5,07	0,00
Natural resources	-4,88	0,00	-13	0,00
Education	-10,88	0,00	-3,15	0,00
Corruption	-5,24	0,00	-33,83	0,00
Inflation	-40,57	0,00		0,00

The stationarity tests indicate that the variables of the model (1.7) are stationary in level apart from one variable: inflation. To check if there is a long-term relationship between the variables, we do the cointegration test of Kao (1999).

Tableau 22: Cointegration test

Test	Kao cointegration test
Number of observations	2124
Period	1960-2015
Null hypothesis	Non cointegrated
Statistics	3,68
Probability	0,01

The variables of the model (1.7) are cointegrated. There is a short term and a long-term relationship between the variables.

F test of the model (1.7):

H₀: Pooled OLS

H₁: Fixed effect

F(7,39) = 1.87 Prob > F = 0.1007

We fail to reject the null hypothesis, so Pooled OLS model is convenient.

Breusch and Pagan Lagrangian multiplier test for random effects of the model (1.7):

H₀: Pooled OLS

H₁: Random effect

chibar2(01) = 0.74 Prob > chibar2 = 0.1954

We fail to reject the null hypothesis, so Pooled OLS model is convenient.

These two tests (F Test and LM Test) sustain that the Pooled OLS model is convenient for the model (1.7).

After the estimations, we conduct diagnostic tests of the model (1.7).

Testing for heteroscedasticity: Wald test

H₀: homoskedasticity

H₁: heteroscedasticity

The test results are as follows: chi2 (18) = 1.3e+30 Prob>chi2 = 0.00

The error terms are heteroscedastic. The OLS estimator is unbiased and consistent but the OLS standard errors are inconsistent.

The insufficient observations does not allow us to perform the Wooldridge test to detect the presence or not of errors autocorrelation. Also the insufficient observations does not allow us to perform the cross-sectional dependence/contemporaneous correlation: using Breusch-Pagan LM test of independence.

Finally we run the OLS model using the robust standard errors (White, 1980). The errors terms are independent and identically distributed (iid).