

## **Governance for economic and social development in Africa: A special references to the IIAG assesses**

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**Abstract:** *When we say Africa we say poverty, disease and war. We just have the wrong vision about it. Today, this big forest continent has changed. We don't have the old disastrous rates about war, floods and corruption. We have improvement in many sectors starting agriculture, natural resources and higher studies.*

*Africa's economic prospects have never been brighter. But realizing this potential depends on governments understanding the private sector and how to support it. This is an extremely important part of the work that the Africa Governance Initiative does.*

*This is big evidence about Africa progress. In fact, most African countries have marked recent years, a significant turning point. Thanks to the role that governance plays in achieving economic and social performance. This has been achieved through the establishment of effective and accountable institutions, whether political, economic or social, plays a key role in achieving social and economic performance especially in the countries of the continent.*

*This paper will focus on the study of the relevance or otherwise of the implementation of the governance model in terms of social and economic performance in Africa. This argument is supported by a governance assessment carried out according to the Ibrahim Index of African Governance.*

**Keywords:** *Governance; Institutions; Africa, IIAG; Economic Development*

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### **I. Introduction**

Most African countries have experienced since the early 80s an economic crisis. The analysis of the factors behind these crises beyond the traditional paradigm focused on explaining the delay by economic variables such as capital requirements, the macroeconomic balance and the opening and liberalization of markets. Other factors, like those relating to political freedom and social and economic opportunities (Sen, 1999) are interpreted as key determinants of this failure. These variables include good governance which is interpreted as a performance vehicle, especially for developing countries. Other factors, like those relating to political freedom and social and Economic Opportunities (Sen, 1999) are interpreted as key determinants of this failure. These variables include good governance which is interpreted as a performance vehicle, especially for developing countries.

Structural Adjustment Plans have been advocated for developing countries following the debt crises of the 80s. These plans have experienced repeated failures manifested through high unemployment, especially among young people, widespread poverty and considerable gap in economic growth compared to developed countries (source, etc.). The lack of institutional capacity, more broadly the deficit in governance, is interpreted as causing the dysfunction of these plans. Thus, the question of good governance renews the debate on development policies, particularly for African countries. Governance is interpreted as an effective tool to fight against all the ills of the African countries (Klibi, 2003). The State is not therefore considered as the only development actor. Governance extends to all levels of business management, including the private sector and civil society. The priority given by African countries to institutions appeared in the mid-90s, adding a new scope on the causes and implications of economic and social performance. (Borner and al., 2004)

The problem at the base of this article is therefore to question the relevance or otherwise of the implementation of the governance model in terms of social and economic performance in Africa. What is the state of governance in most African countries in recent years according to IIAG? Descriptive statistical analysis of two groups of African countries (North Africa and Sub-Saharan Africa), it checks consistency or the difference between the variables in this index? What is the effect of the IIAG on GDP? What is the importance of the varying quality of institutions in the evaluation of governance?

The way forward is, firstly, to make an analysis of the relationship and level of development based on a synthesis of key empirical work. Then we will form a Principal Component Analysis (PCA) to ascertain the significance of all factors that must be reliable and significant. Then we will try from a descriptive analysis of the studied sample to investigate the distribution of IIAG variables on two groups of African countries. Finally, we will try to validate econometric the relationship between GDP and indicators of this index and institutional quality.

## **II. Governance and level of economic development: a synthesis of empirical studies**

The economic analysis of institutions was marked in the early twentieth century by the studies generally classified as heterodox. From the 1970s, institutional economics have been renewed under the impetus of the work called "new institutional economics: NIE" (North, 1993 Williamson, 2000 Coase, ...).

Development strategies have turned to the institutional dimension of the dynamics of the economies (Borner et al. 2004), especially from the 1990s where the content and relevance of the institutions have been significantly shaped. Coase (1937) and Williamson (1975, 1988) investigated the forms of organization of trade under capitalism. They noted that exchange made in the market generates transaction costs. The two parties haven't all important information for this exchange. So it would be more efficient to use an off-market exchange, specifically the internal organization of production and exchange within a company, which will economize transaction costs (Gwenaille, 2008). "Coase" explained that "it is necessary to look [...] contractors to give them some necessary information and to set the conditions of the contract, [...], to set up a control structure of the respective requirements of the parties' obligations, etc. " .

Williamson (1994) has developed the toil of Coase by offering a vision of the economy contrasts with the neoclassical theory. He advocated that we cannot see how a whole and unique theory of the company that do all. The firm is no longer described as a production function only. The theory of transaction costs spot the firm as a governance structure that manages and coordinates transactions. This is a difficult task which requires an inter-disciplinary approach involving law, economics and organization theory.

For North Africa (1990), institutions are seen as rules of game in the society or, more formally, the constraints defined by men to shape their interactions ". In this way, institutions ensure that the rules are respected in a context where different types of transactions are occurring repeatedly. North insists that incentives are used to mediate between institutions and economic performance. Institutions guarantee property rights. If doing so, they diminish the transaction costs and so increase growth.

Other studies have shown that a good incentive of the protection of private property rights stimulates development and increase investment. Also, they allow a better allocation of economic resources (North and Thomas, 1973; North, 1981; Jones, 1981). Some studies conducted from cross-sectional and panel data, helped highlight the role of governance for economic development (Acemoglu, Johnson and Robinson, 2001, 2002; Easterly and Levine, 2003; Rodrik et al., 2004 ; Pande and Udry, 2006). Also, analyzers have focused the analysis of the impact of law institutions of private property for the development of private investment, productivity and agricultural investment (Baseley, 1995; Johnson et al., 2002; Goldstein et Udry, 2005, 2008; Field, 2007). Their results were assumed that investment incentives depend upon the expectations of rights over the returns on to that investment and hence on the nature of property rights.

Other empirical approaches have been interested in the quality of governance of regulatory corpses as a fundamental determinant of the performance of sector regulation (Cubbin and Stern, 2005). In the same perspective, Spiller and Liao (2008) presented a review of the literature on the role of interest groups in the definition of economic policies while Spiller and Tommasi (2007) have emphasized the institutional foundations of political public in the case of Argentina.

Other authors have used the technique of instrumentation to analyze the impact of institutional quality on per capita income (Mauro, 1995; Hall and Jones, 1999; Easterly and Levin, 2003; Rodrik et al., 2004. these studies have shown a positive relationship between institutional quality and growth of GDP per capita. Chong and Calderon (2000) studied the causal relationship between economic growth and the quality of institutions based on data from the period 1972 to 1995, covering 55 developed and developing countries using the VAR technique (vector autoregression). These authors established a causal relationship from GDP growth per capita in improving the quality of institutions.

Kaufmann and Kraay (2002) showed, through a study covering 175 countries over the period 2000-2001 that improving the quality of private property rights institutions is a vector for increased income per capita. However, an increase in the income per capita is not necessarily favorable for improving the quality of institutions.

Rodrik(2005) reinterprets recent growth experience. He was discussed two-pronged growth strategy that differentiates between the challenges of igniting growth and the challenges of sustaini ng it. He showed that good institutions reduce public failures. This reduction will increase the rate of private investment due to the generation of positive externalities. These externalities entail an increase in total factor productivity (TFP).

Quinn and Woolley (2001) used the model of Powell and Whitten (1993) and similar data to examine the countries with "clear Responsibility" for economic affairs<sup>1</sup> and added indicators of volatility. They proposed a new way of reconciling the inconsistent theoretical and empirical literature about the relationship between democracy and economic growth. They showed that democracy reduces the risk of distorting implementation of

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<sup>1</sup> Australia, Austria, Canada, France, Ireland, Japan, New Zeland, Sweden, United Kingdom, and the United States.

economic policies. So democracy trims down instability of economic growth by improving the effectiveness of macroeconomic policies.

Nicoletti and Scarpetta (2006) showed that a flexible regulation of the market of goods in the OECD countries, with reduced public and market failure while ensuring suitable functions, has a stimulatory impact on the development of domestic and foreign investment in these countries.

This result was also found by Besley and Burgers (2004) on the Indian states. Other studies have concluded that labor market regulation differences explain the difference in economic performance in the OECD countries (Freeman, 1998; Blanchard, 2003; Nickell and Layard, 2000).

### III. Good Governance And New Social And Economic Questions: The Iiag

In 2006, Ibrahim created the Mo Ibrahim Foundation<sup>2</sup>, founded in London. The foundation publishes the Ibrahim Index of African Governance (IIAG), ranking the performance of all 52 African Countries<sup>3</sup>. The IIAG is a framework for citizens, governments, institutions and the private sector to accurately assess the delivery of public goods and services, and policy outcomes, across Africa. It is also a tool to help determine and debate government performance and decision-making instrument with which to govern.

Among the empirical work that illustrate the complex relationship in general between governance and development in Africa, we find that of Mo Ibrahim.

The foundation defines governance as the provision of the political, social and economic goods that a citizen has the right to expect from his or her state, and that a state has the responsibility to deliver to its citizens.

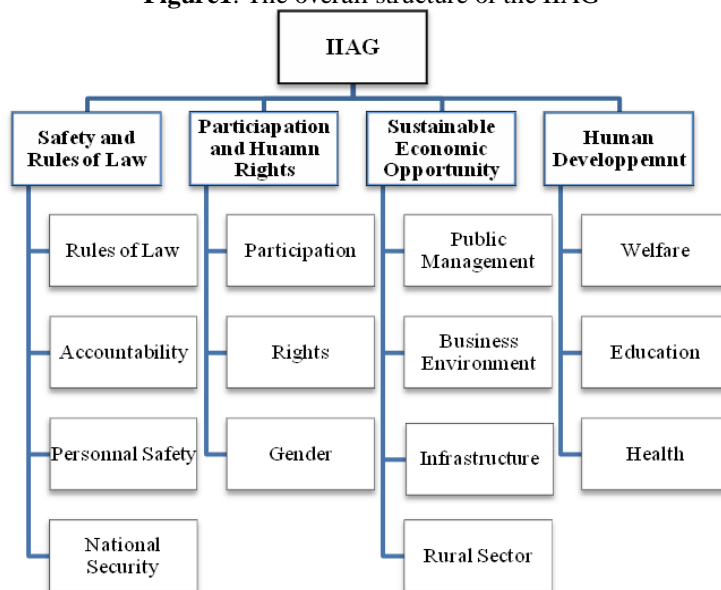
Mo Ibrahim wrote "qualified individuals and a promising land [...]. It lacks a crucial ingredient, governance, quality and adequate leadership." Mo Ibrahim took the initiative for the development of the index in order to develop institutions in Africa.

The Mo Ibrahim Foundation's mission is to improve governance in Africa. It publishes annually the IIAG which is the result of an overall assessment of the performance of African countries in terms of good governance from 88 quantitative and qualitative indicators grouped into four categories: safety and rule of law, participation and human rights, sustainable economic opportunity, and human development.

#### II-1-The overall structure of the IIGA through an explanation by the ACP

The method of the ACP (Benzekri, 1960) consists to group the categories of IIAG in a smaller set. This is the variance-covariance matrix that will allow it to achieve effective resume. For this, it must be sought in areas where the cloud projection distorts the least the initial cloud. The CPA allows eliminating the problems of collinearity between the variables. The database used in this paragraph is that of 2013. The graph below draws the overall structure of the IIAG:

**Figure1.** The overall structure of the IIAG



The IIAG assesses progress under four main conceptual categories: Safety and Rules of Law (SRL), Participation and Human Rights (PHR), Sustainable Economic Opportunity (SEO), and Human Development

<sup>2</sup> In 2007, the Foundation inaugurated the Mo Ibrahim Prize for Achievement in African Leadership.

<sup>3</sup> Until 2009, the index took into account only the 48 countries in Sub-Saharan Africa.

(HD). These four pillars are populated with data that cover governance elements ranging from infrastructure to freedom of expression and sanitation to property rights. Theoretically, the aim of this method is to connect the sub criteria IIAG a variable indicating the level of economic development that is expressed by GDP per head. The empirical work is through the implementation of PCA on all items that are thirteen to retain only those most involved in the definition of the main axes of the PCA. In this regard, this study makes the following assumptions:

**H1:** The Safety and Rules of Law have a significant impact on the economic and social performance (SRL → log (GDP)).

**H2:** The Participation and Human Rights exert a positive effect on economic and social performance (PHR → log (GDP)).

**H3:** Sustainable Economic Opportunity has a positive effect on economic and social performance (SEO → log (GDP)).

**H4:** Human Development has a positive effect on economic and social performance (HD → log (GDP)).

## II-2-Likert items and scale of measurement

Various measurement scales were found to measure the Ibrahim Index of African Governance. Convergent validity was analyzed initially by the matrix of correlations between items and three criteria must be verified:

-The explained variance criterion of withholding the number of factorial axes for global restore a minimum variance percentage for a 50% significance level.

-The Criterion of eigenvalue for each factor that must be greater than 1.

-The Criterion of commonality which assesses the quality of the performances.

### II-1-1- The scale of measurement of the variable "Safety and Rules of Law"

The variable security and rule of law was measured by four items:

**Item1:** Rules of Law

**Item 2:** accountability

**Item 3:** Personal Safety

**Item 4:** National Security

**Item1:** Rules of Law

**Item 2:** Accountability

**Item 3:** Personal Safety

**Item 4:** National Security:

And this is clear in the table below:

**Table 1:** Inter-item matrix measuring Safety and Rules of Law

	Rules of Law	Accountability	Personal Safety	National Security
Rules of Law	1.00			
Accountability	0.895**	1.00		
Personal Safety	0.668**	0.673**	1.00	
National Security	0.577**	0.544**	0.729**	1.00

(\*\*) Correlation is significant at the 0.01 level (bilateral)

Source: Authors' compilation

The correlation matrix has a coefficient of interesting size (0.895; 0.729), so there is a certain level of multi-collinearity between these items. These items are relevant and sufficiently correlated, and the matrix contains no case of singularity.

**Table 2:** Factor Structure Safety and Rules of Law (SRL)

	SRL	Quality of representation
Rules of Law	-	0.821
Accountability	-	0.808
Personal Safety	-	0.770
National Security	-	0.650
Valeurs propres	3.049	-
% of explained variance	76.216	-

Source: Authors' compilation

Referring to the table of the total variance were retained an axis according to the eigenvalue greater than 1 criterion. The axis, thus explains 76.21% of the total variance of the sample and AFCP of the four items

gives a unique factor that explains 76.21% of the total variance of the original data. The factor contributions are positive and higher than 0.6, confirming the unidimensionality of this construct. The quality of representation for each item is also satisfactory ( $\geq 0.7$ ).

*II-1-2- The scale of measurement of the variable "Participation and Human Rights"*

The variable participation and human rights are measured by three items:

**Item 1:** Participate

**Item 2:** Rights

**Item 3:** Gender

**Item 1:** Participate

**Item 2:** Rights

**Item 3:** Gender

The inter-item matrix measuring this variable produced the results shown in Table 3:

**Table 3: Inter-item matrix measuring the Participation and Human Rights**

	Participation	Rights	Gender
Participation	1.00		
Rights	0.892**	1.00	
Gender	0.456**	0.394**	1.00

(\*\*)The correlation is significant at the 0.01 level (bilateral)

Source: Authors' compilation

The correlations between the three items of the scale measuring participation and human rights are positive and significant and demonstrate the uniqueness of the Ickert scale that should be validated with a principal component analysis.

**Table 4: Factor Structure "Participation and Human Rights"**

Variable/items	PHR	Quality of representation
Participation	-	0.894
Rights	-	0.857
Parity	-	0.444
Eigenvalues	2.195	-
% of explained variance	73.160	-

Principal factor component analysis returns a single factor explains 73,160% of the total variance, with positive contributions factorial and greater than 0.7, which also supports the unidimensionality of the built. The quality of representation for each item is also satisfactory ( $\geq 0.8$ )

*II-1-3- The measurement of the scale of the variable "Sustainable Economic Opportunity"*

In our context of study, the sustainable economic opportunity variable is measured by four items on a scale of Ickert to four points:

**Item 1:** Public Management

**Item 2:** Business Environment

**Item3:** Infrastructure

**Item4:** Rural Sector

**Item 1:** Public Management

**Item 2:** Business Environment

**Item3:** Infrastructure

**Item4:** Rural Sector

Indeed, the study of the items of this variable by the method of Principal Component Analysis, although reveals the crucial role of human development in boosting economic performance. Table 5 verifies this hypothesis.

**Table 5: Inter-item matrix measuring the Sustainable Economic Opportunity**

	Public Management	Business Environment	Infrastructure	Rural Sector
Public Management	1.00			
Business Environment	0.824**	1.00		
Infrastructure	0.526**	0.723**	1.00	
Rural Sector	0.734**	0.769**	0.460**	1.00

(\*\*) Correlation is significant at the 0.01 level (bilateral)

The correlations between the four items measuring scale of sustainable economic opportunity are positive and significant and demonstrate the uniqueness of the scale of the Ickert that should be validated with ACP. The Principal Component Analysis adapts well enough situations where some level of multicollinearity exists between the data.

**Table 6: Factor Structure "Sustainable Economic Opportunity"**

Variable/items	SEO	Quality of representation
Public Management	-	0.778
Business Environment	-	0.905
infrastructure	-	0.565
Rural Sector	-	0.747
Eigenvalues	2.997	-
% explained variance	74.926	-

The PCA has allowed three iterations to synthesize four items retained to represent the sustainable economic development by a single factor that explains 74.92% of the total variance, which is highly significant in an exploratory perspective.

*II-1-4-The scale of measurement of the variable "Human Development"*

Finally, the human development variable is measured by two items on a scale of Ickert two points:

- Item 1:** Welfare
- Item 2:** Education
- Item 3:** Health
- Item 1:** Welfare
- Item 2:** Education
- Item 3:** Health

**Table 7: Matrix inter-items measuring the Human Development**

	Welfare	Education	Health
Welfare	1.00		
Education	0.663**	1.00	
Health	0.722**	0.788**	1.00

(\*) Coefficient is significant at the 1%

**Table 8: Factor Structure "Human Development"**

Variable/items	HD	Quality of representation
Welfare		0.768
Education		0.820
Health		0.862
Valeurs propres	2.450	81.666
%de variance expliquée	84.082%	

(\*) Coefficient is significant at the 1%.

The review of the inter-item matrix reveals easily as the first component is defined by the human development had sub-items, which are respectively welfare, health and education, which are highly correlated.

The first axis explains a little more than 84% of the total inertia. The projection of the country on axis 1 shows the contrast between human development for developed countries and least developed countries.

**II-3-Analysis of inter-item correlations**

The objective of this analysis is to verify a form of proximity between the most developed countries in Africa, for confirmation of the role of the categories of IIAG in economic and social development process.

We will test the following partial assumptions:

- H1:** SRL →log(GDP per capita)
- H2:** PHR→log(GDP per capita)
- H3:** SEO→log(GDP per capita)
- H4:** HD→log(GDP per capita)

These assumptions concern the study of the direct relationship between the two variables: GDP per capita that measures the economic performance and which is the subject of a linear regression, with various exogenous variables (independent variables).

This partial relationship of cause and effect results in the study of the following regression function:  $\log(\text{GDP per capita}) = f(\text{independent variable})$ , where f is the simple regression function. The results of this simple linear regression are presented in the table below:

**Table 9:** Dependent variable: GDP per capita

Independent Variable	Coefficient	Standard error	Sig	VF	Sig F	DW	R <sup>2</sup>
SRL	0.003*	0.001	0.002	10.461	0.002	1.818	0.173
PHR	0.002**	0.001	0.091	2.963	0.091	1.972	0.056
SEO	0.003*	0.001	0.001	11.735	0.010	2.039	0.190
HD	0.006*	0.001	0.000	43.659	0.000	1.991	0.466

(\*) Coefficient is significant at the 1%

(\*\*) Coefficient significant at the 5%

The simple regression of "SRL" composed by sub-items of rules of law, personal safety, and national security shows a coefficient equal to 0.003, significant at the 1% level. SRL explained 17.3% of variation in economic growth to a level of significance  $p = 0.002$  showing that this variable affects positively and significantly economic performance. Thus, these results verify the hypothesis H1.

The relationship between the variable participation and human rights which is defined by the three sub items: Participation, Rights and Gender. The variance of the explained variance (GDP per capita) by the PHR variable is meaningful and statistically significant at the 5% level. R<sup>2</sup> coefficient explained 5.6% of the variance. In other words, these results show that the participation and human rights have little impact on economic performance. Thus hypothesis H2 is verified. The results of regression between Sustainable Economic Opportunity composed by sub items Welfare, education and health, and GDP per capita.

Of the four categories of the Ibrahim Index of African Governance, the result of an estimate (0.003) affirms the positive and significant impact at the 1% level between sustainable economic opportunity and economic and social performance. This variable explains 19% of the total variance. The quality of fit is adequate to the discussed theoretical exposure. This assumption is clearly confirmed both by the proximity in terms the most developed African countries as well as the positive relationship between the principal axis and GDP per capita level. Human development category is composed of the following items: Public Management, Business Environment, Infrastructure, and Rural sector, linked with the variable measuring economic performance. Analysis of the link between economic performance and human development is exposed by a coefficient significant and positive at the 1% level (0.006). The quality of fit is good ( $R^2 = 0.466$ ). The relationship between GDP per capita and the first axis of the PCA always indicates a positive movement between human development and economic performance. So, H4 hypothesis is verified.

**II-4-Linear relationship between the different categories of IAG and economic performance**

The relationship between the logarithm of GDP per head and the first axis of the PCA clearly anticipates a positive relationship as expected. It is observed that the most successful countries have the most important security, human development, sustainable economic opportunity and participation and human rights. At the same time, we notice that least developed countries have a low score for categories of IAG. (See Appendix ...).

**II-5- Reliability analysis**

Before the econometric analysis, we wanted to check the internal validity of our classification of the various categories of the index using "Lamda" coefficient. Indeed, the analysis of the reliability coefficient "Lamda" allows studying the properties of measurement scales and items that constitute them. A low coefficient of "Lamda" indicates that the sample of items is the wrong variable. Instead, a high value of "Lamda" indicates that the items are well correlated with their actual scores. A scale is acceptable when it reveals the extent reliable, that is to say constant regardless of the circumstances of the search.

**Table 10:** Reliability analysis for the categories of the Ibrahim Index of African Governance

Variables	Lambda
Safety and rules of Law	0.87
Personal and Human Rights	0.74
Sustainable Economic Opportunity	0.86
Human Development	0.93

We get a lambda of 0.87 for classification "Safety and Rules of Law" and 0.74 for classification "Sustainable Economic Opportunity". As part of confirmatory study, it is generally considered that a lambda is relevant from 0.7 to justify the relevance of the outcome classification of their principal component analysis (PCA). Overall the "Lamda" coefficient indicates a sufficiently high internal consistency.

#### IV. Evaluation Of The State Of Governance In Terms Of Economic And Social Performance

Based on all the above mentioned studies, our goal is to determine the relationship between governance and economic and social performance for a sample of 52 African countries. Our model has a cross-sectional structure.

##### IV-1-Sample descriptive statistics

To answer the formulated problem, we had to choose a sample of two groups of countries, namely North African and Sub-Saharan African countries, on which we try to apply some scientific procedure.

##### IV-1-1-Analysis of indicators according to the IAG

It is reported that the African Governance Ibrahim Index is different from one country to another, which automatically induces a difference or gap between the different categories of the index between northern and Sub-Saharan countries.

The score IAG is measured by the following formula:

$$\sum \sum C_t^i = \frac{X_t^i - \min(x)}{\max(x) - \min(x)} 100$$

Where  $X_t^i$  is the baseline for this indicator for a given country « i » in the year t, where Min (X) and Max (X) are the minimum and maximum values of this indicator for the full period and all countries. The final result is subtracted from 100 where necessary, so that large numbers still indicate a good performance.

Indeed, this index represents a difference between African countries in terms of score. For this reason, we will describe our sample according to the categories Ibrahim Index of African Governance: Safety and Rule of Law, Participation and Human Rights, Sustainable Economic Opportunity and Human Development.

##### IV-1-2-Distribution group North and Sub-Saharan African in the different categories of the IAG

**Table 11: Breakdown of North African countries group according to indicators IAG**

	SRL		PHR		SEO		HD	
	Score	Rang/52	Score	Rang/52	Score	Rang/52	Score	Rang/52
Algeria	46.8%	34	43.4%	31	49.9	23	77.5	7
Egypt	40.9%	42	40.0%	36	54.2	13	69.4	11
Libya	33.2%	47	40.5%	34	27.1	47	67.4	13
Mauritania	43.4%	38	40.1%	35	42.0	32	52.6	36
Morocco	58.7%	15	37.5%	39	69.1	3	70.1	10
Tunisia	59.1%	14	60.6%	15	63.3	7	81	4

For category SRL, Libya, Egypt, Mauritania and Algeria have scores for "Security and Safety of Law" category under for North Africa average (47.0%) and this is due to their poor performance on strengthening its judicial system.

At the top of the scale, Tunisia scores is well (59.1%) because its government has established strong constitutional mechanisms to ensure security and access to justice, despite relatively low scores the only indicator of safety in comparison with northern countries (Algeria, Morocco, Mauritania and Libya).

For PHR category, North African countries are characterized by large differences in the category of "Participation and Human Rights." Tunisia is ranked first of the African group of countries of the North and the fifteenth for the entire sample.

Tunisia attaches great importance against gender inequality since women play a vital role in economic and social life and have almost the same rights as men.

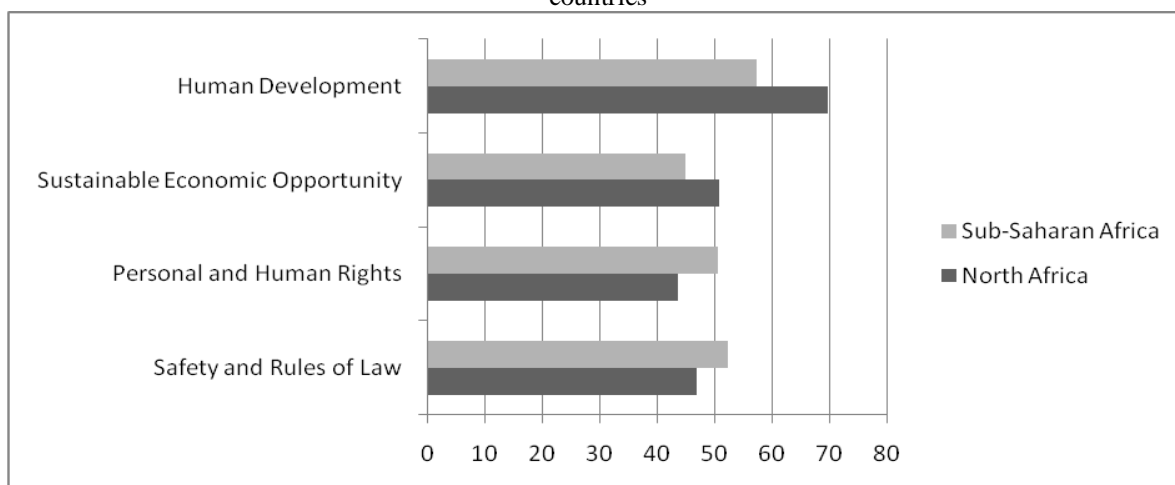
For the category SEO, the average recorded for Northern African countries group is of the order of 50.9%, which promotes the investment environment and actively supports the creation of companies. Morocco is ranked first with a score of 69.1, followed by Tunisia with a score of 63.3%. The Sub-Saharan countries are affected by conflict and occupy the worst places.

For the HD category, the analysis also shows that the competitive position of Tunisia is stable in the human development category. His score was 81% higher than the average in the region (69.7%). the Tables 1, 2, 3 and 4 above indicate that Tunisia is at the head of the score list point of view of the IAG indicators for the African group of countries; except for the score of sustainable economic opportunity.

In our study, we will compare these different categories for the two groups of African countries to determine convergence clubs.



**Figure 2.** Distribution of indicators of IIAG for the North African countries and countries in sub-Saharan Africa countries



For the category safety and rules of law, the most successful countries are: Botswana, Cape Verde and Mauritius with successively 85.3% scores, 84.5% and 78.2% exceeding the average (52.3%).

The categories, participation and human rights are characterized by a remarkable heterogeneity. Indeed, the score varies between 83.5 (Cabo Verde) and 25.9 (Equatorial Guinea).

Mauritius and South Africa recorded the strongest performance for the category “sustainable Economic opportunity” with scores (79.7 and 71.9% successively) that exceed the average for the region.

Mauritius, Seychelles and Cape Verde have scores of 85.6%, 84.4% and 81.6% for the category human development. In the many sub-Saharan countries, the human development indicator exceeds 57.3%. Indeed, we note that social progress is not a result of the wealth of a country, but the outcome of the major role of active policies of redistribution, particularly those concerning the access of all to social services, including a basic education and primary health care quality.

In the Sub-Saharan African group, there are huge differences between these countries, especially for the categories Participation and Human Rights and Sustainable Economic Opportunity.

The categories Participation and Human Rights and Human Development record a significant and positive movement. More than 31 sub-Saharan African countries have improved in the first category and 28 countries in the last.

Moreover, the category Personal and Human Rights appears less encouraging, 24 countries experienced a decline in their performance in this category.

Meanwhile, 32 states have declined in terms of "Safety and Rules of Law," which shows that African citizens feel less secure physically and less autonomous politically.

Overall, the continued economic progress and human development of the continent contrast with the deterioration of security, performance, rule of law, participation and human rights.

The best results from North Africa were recorded in the categories of participation and human rights and human development. So Tunisia is still the most powerful country in most categories of the IIAG, allowing it to occupy important positions in the entire sample. Tunisia ranks first in North Africa and the eighth in Africa with an overall score of 66%. Morocco holds the 2nd place in North Africa and the 14th largest in Africa. Algeria is ranked 20th, Egypt 26 ranks and Mauritania to rank 39 and finally Libya with 43 ranks.

Descriptive statistical analysis allows us to distinguish two important observations. First, the gap between North Africa and sub-Saharan Africa counties in the different indicators of the Ibrahim Index of African Governance on economic and social performance. On the other hand, the inter-country gap that is to say, between the countries of the same group and the divergence of the effect of the categories of the index on development in Africa.

#### IV-2-Test difference and variance comparison

$$H_0 : \delta_1^2 = \delta_2^2$$

$$H_1 : \delta_1^2 \neq \delta_2^2$$

$\delta_1^2 =$  Variance for the Sub-Saharan African country group

$\delta_2^2 =$  Variability in the North African country group.

Our goal is to determine if there is a significant difference between the two groups of countries in our sample and the difference of variances test shows is what we will accept or reject the null hypothesis.

Under hypothesis H0, there is no significant difference between the two groups and under hypothesis H1, we note a significant difference

**Table 12:** Levene's test results on the equality of variances

Variable	Fischer Statistics
SRL	0.956 (0.333)
PHR	5.316 (0.055)
SEO	0.011 (0.918)
HD	0.771 (0.384)

Unlike test statistic of the variance between variables measuring the Ibrahim Index of African Governance shows that we will accept the hypothesis of equality of variances between the two groups of African countries.

Statistics Fischer shows that only the variable "personal human rights" is indicated by a significant difference in variance between the two aforementioned groups and this difference reflects differences in terms of development for the two aforementioned groups at the 1% threshold.

#### IV-3-Test difference and comparing the average values

Before analyzing the results of the econometric estimates, it is necessary to analyze the "natural behavior" of our data by doing some statistical analysis of our sample. To do this, we make average values difference tests for the four categories of the IIAG according to different characteristics of African countries in our sample.

According to the economic approach, these four categories increase and improve the economic and social performance .Statistically; we would expect that the average of these determinants differs between the two groups of African countries.

This is what seems to emerge from the table (6) as appears clear that the two variables which are respectively "participation and human rights and human development" recorded a very significant difference (0.48) at the 5 % and (0.9) at the 1% . "

**Table 13:** Test of difference and comparing the average values

Group of countries	Average variable security
North Country = 1	0.6
Saharan countries = 0	0.56
Security Average difference	0.42**
<b>Average of the variable participation</b>	
North Country = 1	0.52
Saharan countries = 0	0.47
Average attendance difference	0.48**
<b>Average variable opportunity</b>	
North Country = 1	0.42
Saharan countries = 0	0.43
Opportunity Average difference	0.09*
<b>Average variable development</b>	
North Country = 1	0.44
Saharan countries = 0	0.53
Development Average difference	0.9***

- (\*) **Significant coefficient at the 1%.**
- (\*\*) **Significant coefficient at the 5%.**
- (\*\*\*) **significant coefficient at the 10%.**

The average values difference test shows consistent results, the statistic of the test shows that we will accept the hypothesis that the variables "Participation and Human Rights", "Sustainable Economic Opportunities" and "human development" that are the main categories measuring the Ibrahim Index of African governance have significant effects on social and economic performance in African countries

#### IV-4-Econometric modeling

Econometrically, the objective of this study is to identify some predictors of the level of economic performance in 51 African countries to explore the impact of governance on economic and social development.

First, we will estimate the impact of variables IAG to economic performance. Secondly, we will interpret the results.

**IV-4-1- Choice of variables and estimation methods**

We consider the ratio of GDP per capita of a country "i" by that of a reference country or leader. The most powerful leader is the country whose economic performance is close to the average of the sample. The exogenous variables used are classified in two groups: To establish the determinants of economic performance and following this methodology, we obtained a list of potential determinants of governance.

Indicators of the Ibrahim Index of African Governance (IIAG) are respectively:

- Safety and Rule of Law (SRL)
- Participation and Human Rights (PHR)
- Sustainable Economic Opportunity (SEO)
- Human Development (HD)

In the second group variables measuring institutional qualities which are respectively:

- Political Stability (PS)
- Corruption (C)
- Order and laws (OL)
- Bureaucratic Quality (BQ)
- Democratic Accountability (DA)

The model to be estimated is given by the following linear equation:

$$Log PIB / PIB_{Guineau} = \alpha_0 + \alpha_1 SRL + \alpha_2 PDH + \alpha_3 OED + \alpha_4 DH + \varepsilon_i \quad (1)$$

With:  $\varepsilon_i$  = unobservables

To estimate the model, we proceeded with the doubles ordinary least square method that the estimation results are presented in the following table:

**Table 14:** Variable dépendante : Log [(PIB/PIB<sub>Guineau</sub>)]

variables	coefficients	P> t
SRL	0.0081247	0.589
PDH	-0.0204623*	0.053
DED	0.0528023***	0.007
Hd	0.0240783**	0.046
Constant	4.38921	0.0000
Number of countries	51	
R <sup>2</sup>	0.49	
Residues normality test	13.61	
Chi-square statistics	(0.0011)	

(\*) Significant coefficient at the 10%.

(\*\*) Significant coefficient at the 5%.

(\*\*\*) significant coefficient at the 1%.

Table (19) brings up the estimated coefficients of the different selected specifications. The associated autoregressive coefficient term is close to 0.5. However, our tests indicate that sustainable economic opportunity and human development positively affect economic performance. Indeed, a 1% increase in human development leads to an increase of 0.024% in GDP at the level of 5%. Human development can constantly stimulate economic growth.

The tests are negative and generally appear significant relationship between participation and human rights, and the log of GDP per head relative. Indeed, the unit increase participation and human rights cause a reduction of 0.0204 in the log of GDP per head. The chi-square statistic accepts the alternative hypothesis of non-normality of residuals. To measure the governance effect by adding the institutional quality variables to the Ibrahim Index of African Governance, we will proceed to the following modeling regressions:

$$Log PIB / PIB_{Guineau} = \alpha_0 + \alpha_1 SRL + \alpha_2 PDH + \alpha_3 OED + \alpha_4 DH + \alpha_5 SP + \varepsilon_i \quad (2)$$

$$Log PIB / PIB_{Guineau} = \alpha_0 + \alpha_1 SRL + \alpha_2 PDH + \alpha_3 OED + \alpha_4 DH + \alpha_5 SP + \alpha_6 C + \varepsilon_i \quad (3)$$

$$Log PIB / PIB_{Guineau} = \alpha_0 + \alpha_1 SRL + \alpha_2 PDH + \alpha_3 OED + \alpha_4 DH + \alpha_5 SP + \alpha_6 C + \alpha_7 QL + \varepsilon_i \quad (4)$$

$$Log PIB / PIB_{Guineau} = \alpha_0 + \alpha_1 SRL + \alpha_2 PDH + \alpha_3 OED + \alpha_4 DH + \alpha_5 SP + \alpha_6 C + \alpha_7 QL + \alpha_8 QB + \varepsilon_i \quad (5)$$

$$Log PIB / PIB_{Guineau} = \alpha_0 + \alpha_1 SRL + \alpha_2 PDH + \alpha_3 OED + \alpha_4 DH + \alpha_5 SP + \alpha_6 C + \alpha_7 QL + \alpha_8 QB + \alpha_9 RD + \varepsilon_i \quad (6)$$

**Table 15:** Dependent variable log (PIB/PIB<sub>Guineau</sub>)

	M1	M2	M3	M4	M5
<b>SRL</b>	0.0104869	0.0120984	0.0150041	0.012568	0.0121516
<b>PDH</b>	-0.018860	-0.0199863	-0.022074	-0.0217	-0.020945
<b>DED</b>	0.0411629	0.0425893	0.0452516	0.0475103	0.0466848
<b>DH</b>	0.026016	0.0248279	0.024039	0.02343	0.0235995
<b>Categories of the Ibrahim Index Of African Governance (IIAG)</b>					
<b>SP</b>	0.2069836 <sup>***</sup>	0.2167287	0.2115847	0.21344	0.2124726
<b>C</b>		-0.08432	-0.123386	-0.13423	-0.133613
<b>OL</b>			-0.10475	-0.10911	-0.104605
<b>QB</b>				0.094784	0.1066394
<b>RD</b>					-0.03533
<b>Institutional quality indicators</b>					
<b>Number of observations</b>	52	51	51	51	51
<b>R<sup>2</sup></b>	60.07%	60.36%	61.55%	61.99%	62.16%
<b>Statistical Fischer</b>	13.54 (0.0000)	11.17 (0.00000)	9.83 (0.0000)	8.56 (0.000)	7.48 (0.0000)

At 5 regressions, most of the coefficients are individually significant.

The coefficient of determination, R<sup>2</sup> reflects the degree of explicatively of the change in GDP by Ibrahim Index of African Governance indicators that are SRL, PDH, DH, and OED; and institutional quality variables, which are respectively SP, C, OL, QB, and RD. (See Appendix 12)

#### IV-4-2- Interpretation of results

In the five regressions, the variables SRL, PHR, OED, and DH are significantly involved in explaining the variation in GDP. In addition, political stability is of the order of 0.2069836: a 1% increase in political stability leads to an improvement of 0.2069836 in GDP per capita and this is relatively large. Moreover, taking into account the integration of the five variables measuring institutional quality has improved results compared to the first regression. Indeed, the introduction of these variables improved the elasticity of GDP with respect to safety and rules of law which is in the order of (0.0121516), and in relation to sustainable economic opportunity either (0.0466848). R<sup>2</sup> passes from 60.07% to 62.16% following the integration of a variable for each regression, which confirms that the quality of fit is adequate to the I pre-exposures theoretical discussion.

Comparison of the results for different regressions shows that variables measuring institutional qualities explain with better GDP per head. At this level, estimates show that economic performance is relatively dependent on different categories of IIAG. So our empirical work shows that only security and rules of law has no effect on economic performance unlike other categories that impact is still not significantly different from zero. The different variables on which the index is based exerted a significant impact on social and economic performance in Africa. The following table presents the nature of the expected impact of exogenous variables on economic performance.

### V. Conclusion

Empirical studies have shown that good governance, which encouraging the development of private investment, generate an improvement in TFP, this improvement generates competitiveness gain. This gain is an essential expense for the sustainability and growth. These studies have focused on a few institutions such as democratic institutions, protection of private property rights institutions, institutions of regulating economic activities, etc. From the method of principal factorial component analysis, we checked the Ibrahim Index of African Governance structure.

Descriptive statistical analysis of two groups of African countries, i.e. North African and sub-Saharan African countries leads to verify, firstly, the significant difference between the variable's index and their distributions in the two groups, secondly, the crucial role of these different categories in the economic and social development in the African continent. Indeed, countries have to all topics, superior results, some recorded impressive improvements related to the beginnings of a plan to get to the bottom of socio-economic development, and others recorded the worst performance.

Econometric modeling allows, from the first model, to verify the effect of the four categories of the index of GDP, and then integrating the variety of institutional quality, there is a significant improvement of R<sup>2</sup>, thus verifies the importance of different variables in the index in the evaluation of governance in African countries.

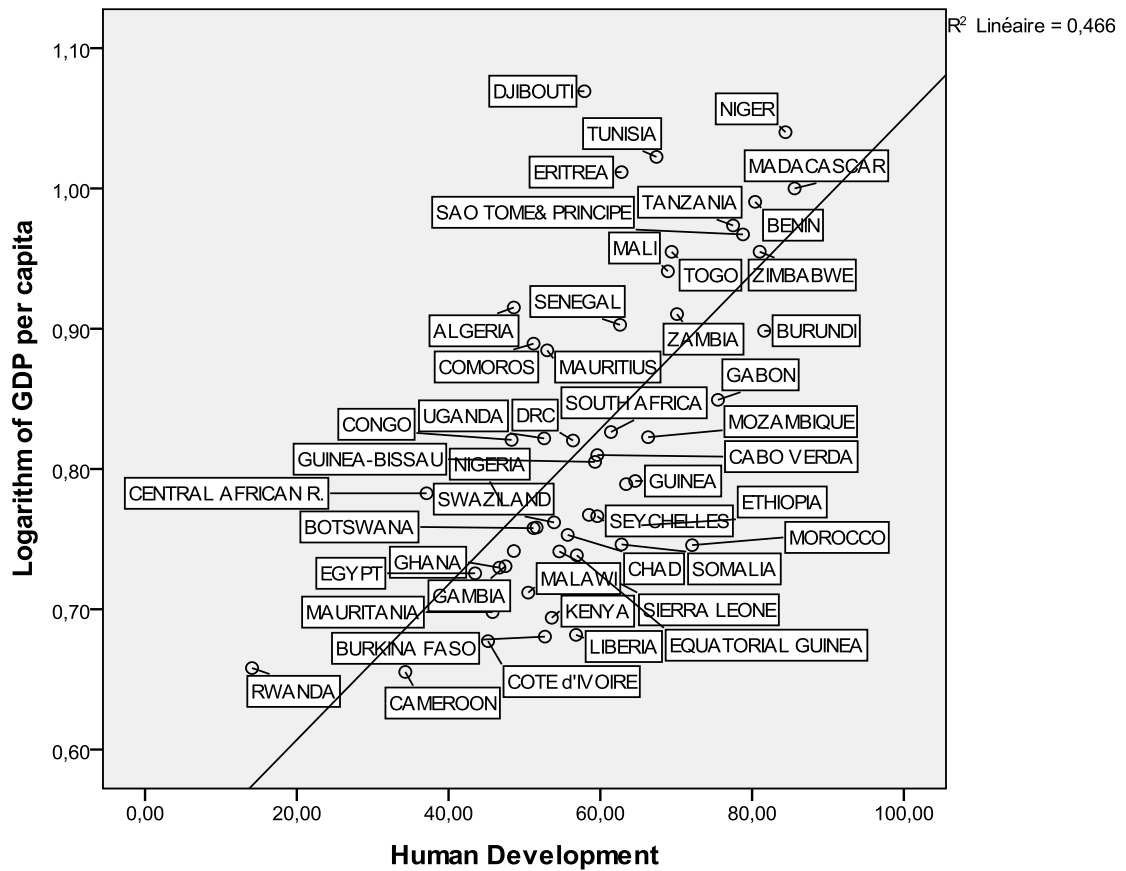
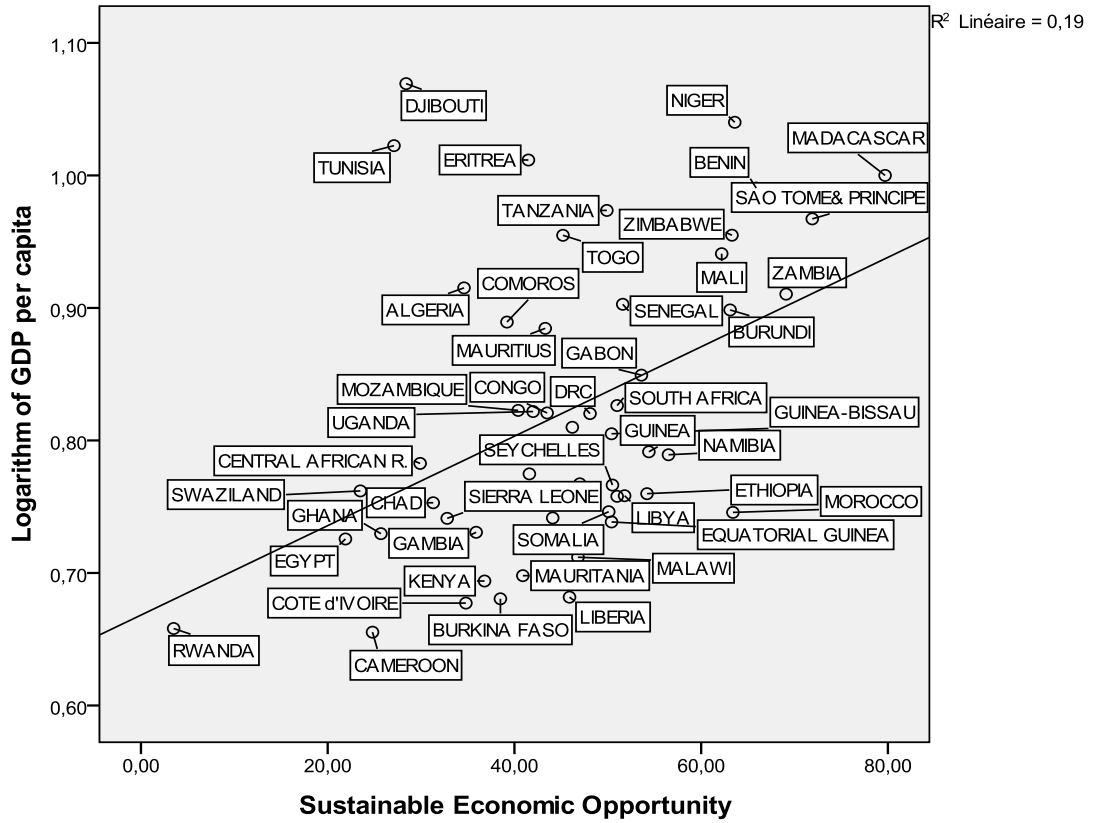
In the end, Challenges of governance in Africa are enormous and are often exacerbated by globalization. They result in the persistence of many negative signs, especially in countries in conflict.

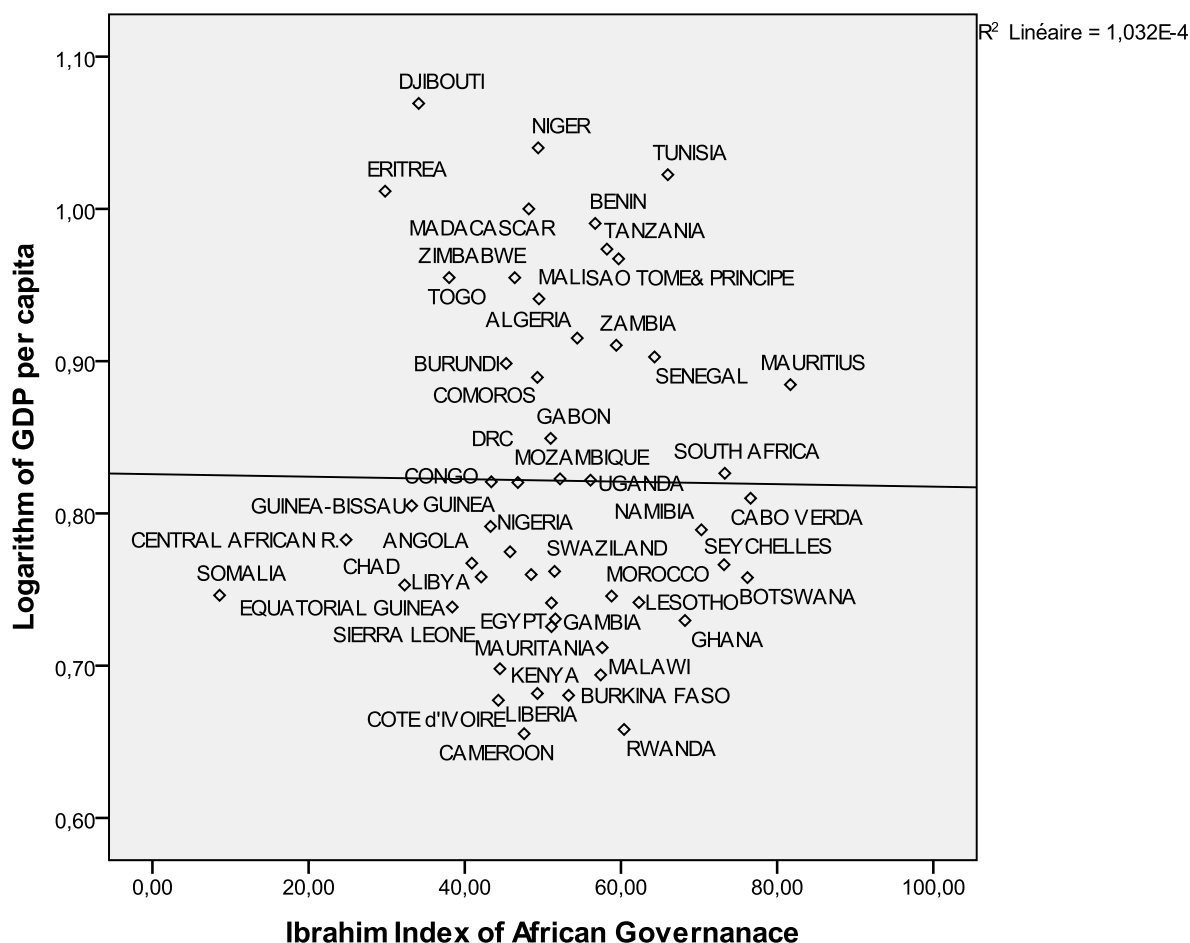
Corruption is the enemy of development, and of good governance. It must be got rid of. Both the government and the people at large must come together to achieve this national objective. Despite the crisis, Africa is on a path of development. There is a big need to accelerate more the progress in governance. Someday Africa will beat all these challenges; it's a problem of patience and persistence. We should continue until we achieve the best model of governance.

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	Overall score			Safety and rules of law			Participation and human rights			Human development		
	Rank /52	Score/100	Change since 2012	Rank/52	Score/100	Change since 2012	Rank /52	Score/100	Change since 2012	Rank/52	Score/100	Change since 2012
Algeria	20	54,4	+1,2	34	46,8	+2,5	23	49,9	+1,9	7	77,5	+0,2
Egypt	26	51,1	-4,6	42	40,9	-9,2	13	54,2	-4,8	11	69,4	-0,4
Libya	43	42,1	-4,2	47	33,2	-4,1	47	27,1	-10,6	13	67,4	-2,3
Mauritania	39	44,5	-3,5	38	43,4	-5,1	32	42,0	-3,7	36	52,6	+1,3
Morocco	14	58,8	+1,1	15	58,7	-0,5	3	69,1	+6,5	10	70,1	-0,3
Tunisia	8	66,0	+0,9	14	59,1	+0,3	7	63,3	-1,3	4	81,0	-1,0
North Africa	-	52,8	-1,5	-	47,0	-2,7	-	50,9	-2,0	-	69,7	-0,4

**North Africa 2013 score/100**

	52,8	47,0	43,7	50,9	69,7
Algeria	54,4	46,8	43,4	49,9	77,5
Egypt	51,1	40,9	40,0	54,2	69,4
Libya	42,1	33,2	40,5	27,1	67,4
Mauritania	44,5	43,4	40,1	42,0	52,6
Morocco	58,8	58,7	37,5	69,1	70,1
Tunisia	66,0	59,1	60,6	63,3	81,0

**Sub-Saharan Africa 2013 Score/100**

	51,3	52,3	50,7	44,9	57,3
Angola	40,9	43,1	37,3	34,6	48,6
Benin	56,7	55,6	65,6	47,0	58,5
Botswana	76,2	85,3	73,1	65,9	80,4
Burkina Faso	53,3	57,7	53,2	51,0	51,2
Burundi	45,3	40,4	49,6	38,5	52,7
Cabo Verde	76,6	78,2	83,5	63,1	81,6



Cameroon	47,6	45,4	39,3	46,2	59,6
CAR	24,8	12,0	28,2	24,8	34,3
Chad	32,3	33,9	28,1	29,9	37,1
Comoros	49,3	56,6	53,8	31,3	55,7
Congo	43,4	45,0	38,1	39,2	51,2
Côte d'Ivoire	44,3	41,6	43,9	43,5	48,3
DRC	34,1	23,7	32,6	34,8	45,2
Djibouti	46,8	50,6	32,1	48,1	56,4
Equatorial Guinea	38,4	41,5	25,9	28,4	57,9
Eritrea	29,8	31,0	22,8	21,9	43,5
Ethiopia	48,5	50,0	36,7	50,4	56,9
Gabon	51,0	57,6	42,0	41,5	62,8
Gambia	51,6	50,2	36,4	54,2	65,4
Ghana	68,2	69,9	73,6	53,6	75,5
Guinea	43,3	46,5	43,2	35,9	47,5
Guinea-Bissau	33,2	30,5	30,1	25,7	46,7
Kenya	57,4	51,3	59,3	54,4	64,6
Lesotho	62,3	69,5	69,9	50,4	59,3
Liberia	49,3	51,5	55,4	36,8	53,6
Madagascar	48,2	49,0	51,0	44,1	48,6
Malawi	57,6	64,6	62,9	45,9	56,8
Mali	49,5	48,6	45,9	51,8	51,6
Mauritius	81,7	84,5	77,0	79,7	85,6
Mozambique	52,2	50,8	60,7	46,8	50,5
Namibia	70,3	74,9	75,0	62,2	68,9
Niger	49,4	56,0	55,0	40,9	45,8
Nigeria	45,8	38,1	48,9	43,3	53,0
Rwanda	60,4	58,2	47,7	63,4	72,1
São Tomé & Príncipe	59,7	65,7	66,5	40,4	66,3
Senegal	64,3	63,5	73,7	56,7	63,4
Seychelles	73,2	70,8	74,1	63,6	84,4
Sierra Leone	51,1	58,5	57,4	41,6	47,1
Somalia	8,6	5,9	10,7	3,5	14,1
South Africa	73,3	68,1	74,4	71,9	78,8
Swaziland	51,5	60,8	31,0	51,6	62,6
Tanzania	58,2	57,4	65,5	50,5	59,6
Togo	46,4	54,6	43,8	32,8	54,6
Uganda	56,1	53,3	58,4	50,1	62,8
Zambia	59,4	65,1	60,4	51,0	61,4
Zimbabwe	38,0	37,7	37,0	23,5	53,9

**Instrumental variables (2SLS) regression**

Source	SS	df	MS	
Model	34.5586503	4	8.63966257	Number of obs = 52
Residual	30.564519	47	.650308914	F( 4, 47) = 13.29
Total	65.1231692	51	1.27692489	Prob > F = 0.0000
				R-squared = 0.5307
				Adj R-squared = 0.4907
				Root MSE = .80642

pibt	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
sécurité_e~i	.0081247	.014929	0.54	0.589	-.0219085 .0381579
participat~m	-.0204623	.0102899	-1.99	0.053	-.041163 .0002384
opportunit~e	.0528023	.0185851	2.84	0.007	.0154139 .0901908
développement	.0240783	.0117726	2.05	0.046	.0003949 .0477616
_cons	4.38921	.5107413	8.59	0.000	3.361731 5.416689

Instrumented:

Instruments:

**Skewness/Kurtosis tests for normality**

----- joint -----

Variable	Pr(Skewness)	Pr(Kurtosis)	Adj chi2(2)	Prob>chi2
residus	0.001	0.020	13.61	0.0011

**Model: M1**

Instrumental variables (2SLS) régression

Source	SS	df	MS	Number of obs = 51
Model	39.0764782	5	.81529564	F( 5, 45) = 13.54
Residual	25.9801306	45	.577336235	Prob > F = 0.0000
				R-squared = 0.6007
				Adj R-squared = 0.5563
Total	65.0566088	50	1.30113218	Root MSE = .75983

piibt	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
SRL	.0104869	.0141989	0.74	0.464	-.0181112	.0390851
PDH	-.0188605	.0097142	-1.94	0.058	-.0384259	.0007048
OED	.0411629	.0180318	2.28	0.027	.0048449	.0774809
DH	.0260168	.0111259	2.34	0.024	.0036081	.0484256
SP	.2069836	.0734653	2.82	0.007	.0590168	.3549504
_cons	2.741631	.7572604	3.62	0.001	1.21643	4.266831

**Model : M2**

Instrumental variables (2SLS) régression

Source	SS	df	MS	Number of obs = 51
Model	39.2662717	6	6.54437862	F( 6, 44) = 11.17
Residual	25.790337	44	.586144023	Prob > F = 0.0000
				R-squared = 0.6036
				Adj R-squared = 0.5495
Total	65.0566088	50	1.30113218	Root MSE = .7656

piibt	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
SRL	.0120984	.0145844	0.83	0.411	-.0172946	.0414914
PDH	-.0199863	.0099859	-2.00	0.052	-.0401116	.000139
OED	.0425893	.018341	2.32	0.025	.0056255	.0795532
DH	.0248279	.0114035	2.18	0.035	.0018456	.0478102
SP	.2167287	.0759788	2.85	0.007	.0636034	.3698539
C	-.0843279	.1481948	-0.57	0.572	-.382995	.2143391
_cons	2.77346	.7650624	3.63	0.001	1.231578	4.315342

Instrumented:

Instruments:

**Model: M3**

Instrumental variables (2SLS) regression

Source	SS	df	MS	Number of obs = 51
Model	40.0439613	7	5.72056591	F( 7, 43) = 9.83
Residual	25.0126474	43	.581689475	Prob > F = 0.0000
				R-squared = 0.6155
				Adj R-squared = 0.5529
Total	65.0566088	50	1.30113218	Root MSE = .76269

pibt	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
SRL	.0150041	.0147446	1.02	0.315	-.0147313	.0447395
PDH	-.0220741	.0101104	-2.18	0.035	-.0424637	-.0016844
OED	.0452516	.0184157	2.46	0.018	.0081129	.0823904
DH	.0240394	.0113805	2.11	0.041	.0010883	.0469905
SP	.2115847	.0758202	2.79	0.008	.0586788	.3644907
C	-.123386	.1514459	-0.81	0.420	-.4288056	.1820337
OLs	-.1047519	.090595	-1.16	0.254	-.2874541	.0779504
_cons	3.046825	.7979768	3.82	0.000	1.437552	4.656099

Instrumented:  
Instruments:

**Model: M4**

Instrumental variables (2SLS) regression

Source	SS	df	MS	Number of obs =	51
Model	40.3297464	8	5.0412183	F( 8, 42) =	8.56
Residual	24.7268624	42	.588734819	Prob > F =	0.0000
				R-squared =	0.6199
				Adj R-squared =	0.5475
Total	65.0566088	50	1.30113218	Root MSE =	.76729

pibt	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
SRL	.0125689	.0152399	0.82	0.414	-.0181864	.0433242
PDH	-.0217773	.0101804	-2.14	0.038	-.0423222	-.0012324
OED	.0475103	.0188084	2.53	0.015	.0095535	.0854671
DH	.023438	.0114818	2.04	0.048	.0002669	.0466091
SP	.2134439	.0763246	2.80	0.008	.0594146	.3674732
C	-.1342346	.1531538	-0.88	0.386	-.4433115	.1748424
OL	-.1091146	.0913568	-1.19	0.239	-.2934802	.0752509
QB	.0947844	.1360433	0.70	0.490	-.1797621	.3693309
_cons	2.997994	.8058483	3.72	0.001	1.371727	4.624262

Instrumented:  
Instruments:

**Model: M5**

Instrumental variables (2SLS) regression

Source	SS	df	MS	Number of obs =	51
Model	40.4415475	9	4.49350528	F( 9, 41) =	7.48
Residual	24.6150613	41	.600367348	Prob > F =	0.0000
				R-squared =	0.6216
				Adj R-squared =	0.5386
Total	65.0566088	50	1.30113218	Root MSE =	.77483

pibt	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
SRL	.0121516	.01542	0.79	0.435	-.0189898	.043293
PDH	-.0209455	.0104597	-2.00	0.052	-.0420692	.0001782
OED	.0466848	.0190894	2.45	0.019	.0081331	.0852365
DH	.0235995	.0116007	2.03	0.048	.0001715	.0470275
SP	.2124726	.0771078	2.76	0.009	.0567501	.368195
C	-.1336134	.1546662	-0.86	0.393	-.4459681	.1787412
OL	-.1046058	.0928447	-1.13	0.266	-.2921096	.082898
QB	.1066394	.1401006	0.76	0.451	-.1762994	.3895782
RP	-.0353314	.081874	-0.43	0.668	-.2006794	.1300166
_cons	3.096359	.845092	3.66	0.001	1.389661	4.803057

**Descriptive statistics of the sample**

Variable		Mean	Std. Dev.	Min	Max	Observations
SRL	overall	56.72077	14.32795	26.48	89.61	N = 52
	between		14.32795	26.48	89.61	n = 52
	within		0	56.72077	56.72077	T = 1
PDH	overall	47.90019	16.93098	19.22	78.33	N = 52
	between		16.93098	19.22	78.33	n = 52
	within		0	47.90019	47.90019	T = 1
OE	overall	43.64942	10.83753	19.17	66.74	N = 52
	between		10.83753	19.17	66.74	n = 52
	within		0	43.64942	43.64942	T = 1
DH	overall	52.23904	14.37818	28.08	96.02	N = 52
	between		14.37818	28.08	96.02	n = 52
	within		0	52.23904	52.23904	T = 1
SP	overall	8.914767	1.514435	5.45	12	N = 52
	between		1.514435	5.45	12	n = 52
	within		0	8.914767	8.914767	T = 1
C	overall	1.851954	.7915026	0	4	N = 52
	between		.7915026	0	4	n = 52
	within		0	1.851954	1.851954	T = 1
OL	overall	2.814052	1.26467	.5	6	N = 52
	between		1.26467	.5	6	n = 52
	within		0	1.851954	1.851954	T = 1
QB	overall	1.275327	.8447172	0	3	N = 52
	between		.8447172	0	3	n = 52
	within		0	1.275327	1.275327	T = 1
RB	overall	3.012283	.8447172	0	3	N = 52
	between		.8447172	0	3	n = 52
	within		0	1.275327	1.275327	T = 1
pibt	overall	7.432519	1.130011	5.22035	10.11739	N = 52
	between		1.130011	5.22035	10.11739	n = 52
	within		0	7.432519	7.432519	T = 1