Governance quality indicator: a necessarily local approach of calculation

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Abstract

The revolution in the Arab world shows that governance variables are as important as are the classical variables (capital and labour). The denial of political rights, respect of lows and accountability leads to inefficiency and low rate of economic growth in the long run. Over the last 15 years, most of the World Bank studies have focused on development of standards governance indicators which do not take into consideration the realities of developing countries such as Tunisia. Many countries have adopted these indicators to measure their governance quality. Yet none, to our knowledge, has attempted to define its local governance indicators. The purpose of this study is to show the need for developing a local governance indicator. The following variables have been selected: contract intensive money, foreign direct investment, scientific and technical articles produced and budgetary policy of the State to elaborate a local governance indicator.

Our results indicate that governance variables affect economic growth. According to our results, improving the financial sector, scientific research and State spending policy can enhance economic growth.

Keywords: Standard governance indicators, Local governance indicator, public governance quality and economic growth

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1. Introduction

Since the Nineties, the World Bank developed governance indicators standards. These indictors are useful tools for researchers, international investors and policy-makers to carry out their work. But in spite of their importance, these indicators are criticized for a number of reasons and by a number of researchers.

For example, Berthelier et al, (2003) and Ould Aoudia (2006) suggest the use of other variables to measure governance quality. As for, Hayami (1999) and Aoki (2001) find it more pertinent to develop a local indicator specific to each country. Despite these studies there is the need to give the developing countries the opportunity to adopt their own governance indicators allowing them to improve the relation between governance, growth and development.

Understanding the fact that governance variables affect economic growth as a matter of fact, our purpose in this study is to develop a local public governance indicator.

In what follows, we first present a review of previous studies specially a critical study of Daniel Kaufmann, Aart Kraay and Pablo Zoido-Lobaton (World Bank indicators) in Section 2; we then describe our research hypotheses in Section 3; we provide the methodology and results in Section 4; and our conclusion is in Section 5.

2. Review of previous research

In Tunisia, empirical research on local governance indicators is almost non-existent. Most of the studies available are of a standard and normative nature.

The most important governance indicators used are those of Kaufmann et al go back to1996.

2.1. Presentation of Kaufmann et al indicators

A number of researchers (Mauro, 1995; Keefer and Knack, 1995) have tried to measure governance quality. However, World Bank indicators are the most complete and the commonly used of the accessible indicators. They have been produced by Daniel Kaufmann, Aart Kraay and Pablo Zoido - Lobaton (KKZ). They are the first to enumerate a series made up of six indicators, the average of which constitutes a measure of governance quality. Thus producing a sum up of the initial 250 indicators covering 212 countries. KKZ indicator consists of six subgroups of

indicators which are: voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption.

Each of the six aspects of the governance is based on hundreds of perception indicators drawn from 37 data sources produced by 31 organizations[2]. These indicators have been presented in time series since 1996.

The main criticisms that can be addressed to the Kaufmann et al indicators are of methodological and technical natures.

2.2. Kaufmann et al indicators: the criticisms

The main criticisms that can be addressed to the KKZ indicators are their pretension to be universal, their high deterministic degree, low operational effect and their errors of calculation.

2.2.1 KKZ Indicators: universalistic and deterministic pretension

Kaufman et al. assume that by improving the level of these indicators, economic growth can be promoted. However, these indicators cannot guarantee growth for all countries independently of their initial level of growth, their human capital and their political and social structure.

For example, Stern et al. (2005) show that improving political freedom ensures economic growth in poor countries only. Thus, we wonder which level of a country income allows positive effect of political freedom on economic growth?

Malaysia, India and China have at the same time a high level of corruption and a high economic performance (Khan 2006). He sustains the idea that economists should define various forms of corruption and study the relationship between each form and its effect on economic growth. We wonder if the weakness of some governance indicators can necessarily hinder economic growth?

Kaufman et al since (1996) show that a democracy leads to good quality of governance and enhances economic growth. While, autocracy leads to low quality of governance which hinder economic growth. However, the effect of authoritarian regime on the growth is not clear. Barro (1996) considered that the dictatorship can promote growth if it does not inhibit economic freedom and the rights to private property. For example, autocracy in China and in Chile had lead

[2] See Kaufmann and al. 2005.

to economic development (Khan 2000). Whereas, democracy can lead to State capture and corruption which can prevent economic freedom.

Kaufman et al (1996-2009) assume that instability causes insecurity which as a result discourages local and foreign investment. However, Brunetti et al (1998) show through field research that the relation between political stability and the feeling of uncertainty among investors are very vague. Added to that, government efficiency, quality of regulations and the respect of the rules of law do not depend on political freedoms or the nature of the political regime. Consequently, the indicators established by Kaufmann et al. can be checked in case of developed countries and remains to be verified in developing countries which weakens the universal and deterministic aspect of the KKZ indicators.

Thus, the improvement in governance indicators does not automatically lead to the improvement in economic growth.

2.2.2 KKZ Indicators: weak operational capacity

The difficulties to "operationalizing" the KKZ indicators for developing countries such as Tunisia reduce credibility and their utility. Indeed, these indicators cannot reflect the quality of governance and this for several reasons:

Firstly, the effect of the informal institutions has been neglected although they have a considerable effect on growth (North 2005);

Secondly, most of the time, KKZ indicators include a degree of subjectivity. They depend on researchers that's why we do not find the same measure for the same aspect of governance;

Thirdly, we can often make confusion between institutions and their effects (growth and poverty reduction) when we try to measure governance quality (Glaeser et al, 2004). This confusion rises from the lack of measurable concepts of governance quality (Aron 2000);

Fourthly, the use of a large number (six) governance indicators makes it difficult to isolate the effect of each and everyone of them on growth.

Hence, the difficulty of making KKZ governance indicators operational reduces their utility.

2.2.3 KKZ Indicators: limits of calculation

The limits in the calculation of KKZ indicators are related to the technical and informational aspects. The correlation between the 37 sources of information used is the main limitation retained against KKZ calculation. This correlation can come from the subjectivity of

the experts and the data circulation between the various sources. On the statistical level, the terms of error covariance are not different from zero and thus we cannot use the method of maximum likelihood (the method of the Generalized Method of Moments GMM is more advisable).

Another difficulty comes from the fact that we can not reproduce the calculation of the KKZ indicators. The data drawn from the sources are not accessible or they are too costly to acquire. It's the case of the indicators established by "Freedom house ". This organization does not publish its notations of the countries that are related to particular issues.

Confronted to theses difficulties many authors (Aron 2000) come to believe that governance quality can indirectly be measured through indicators such as human capital within a given economy. Berthelier et al, (2003); Ould Aoudia (2006) use the concept "capture of the institutional variables" to determine the variables supposed to measure governance quality such as the interest rate, commercial openness, financial openness, etc. According to theses studies, we can measure the governance quality by using variables which reflect the governance quality and which are simply to measure.

3. Indicator of the governance quality: calculation method

We consider that governance quality measurement has three aims. First, we consider that measurement of governance quality is an explanatory variable of economic growth; we must be able to measure it. Second, this measurement was justified by the need to develop a local public governance indicator. Third, it is significant to measure the quality of governance if we want to improve it. Here after, we introduce the hypothesis we have adopted:

3.1. Hypothesis: choice of variables

H_1 Money saved: indicator of trust

The choice of "contract intensive money" variable aims at examining the relation between Tunisian people and banks "State-banks collusion" (Meisel and ould Aoudia 2007). The State must guarantee the respect of laws and the protection of private property. Knack and Keefer

(1997) show that the ratio: "contract intensive money" [ICM : $(\frac{M_2 - M_1}{M_2})$[3]] can constitute an objective measure of property rights protection in Tunisia. It is the ratio of non-currency money to the total money supply. It expresses the trust of Tunisian people in the monetary system, otherwise, they prefer to have currency money. At the time of the political, social and economic crisis in Tunisia (January 14 2011), the deposits in banks increased of only by 3, 6%[4]. At the light of this, we suppose that this ratio (ICM) can constitute an objective measure of the trust in the banking system. People's trust explains the development of business environment. According to Brunetti et al (1998), the passage to a higher level of credibility and trust in business environment led to an increase in the rate of investment going up to 20%.

H_2 Foreign direct investment: an indicator of quality of business environment

Foreign direct investment is an indicator of the State internal and external policy. A good quality of governance can be measured by the measures taken which provide opportunities to foreign investors (Blomström et al. 1992). For that, we adopt the ratio: "foreign direct investments in the total investment" $PIDE = \frac{IDE}{IT}$ (IDE : foreign direct investment and IT : total investment). On the one hand, the entry of foreign direct investment reflects the business environment quality. On the other hand, foreign direct investment can constrain the government to implement institutional reforms. According to Kose et al. (2006), foreign investments improve the quality of the institutional environment.

H_3 Scientific product: an indicator of the government role in education

According to Joseph E. Stiglitz, (the reception speech of the Nobel Prize, 2001), the government has an educational role to play, by encouraging the creativity and setting up institutions which encourage education, research and development. These institutions constitute an indicator of the State policy and the governance quality in general.

Knowledge Economy Index (KEI) which is used to measure the degree of participation of various countries in the knowledge economy shows that the countries which are part of the MENA zone are below average and their result are often lower than the result of the majority of

[3] M_1 is the fiduciary currency except money in bank. M_2 represents the currency and quasi-money (M_1 and deposits in the bank).

[4] Bulletin of the Financial Statistics of the Central Bank,Tunisia (September, 2011).

the economies in transition (World Bank, 2005). Moreover, the calculation of this index is based on four major criteria among which governance quality of the environment is most important.
The World Bank (2005) explains the weak scientific production by the lack of inciting measures that encourage individuals to work and acquire a high level of knowledge and competence. For that, we use the indicator "numbers of journals and scientific and technical articles ($JAST$) produced per year " as the variable of the governance quality.

H_4 Budgetary expenditure, deficit and odious debt [5] : an indicator of decision makers behaviour

The governance quality of any country is characterized by how well the public institutions function. In the light of this, we suppose that the relationship between the budget deficit and the public expenditures ($\frac{DEF}{DEP}$), (DEF is the public deficit, DEP is the public expenditure) can reflect the extent of the deficit compared to the public expenditure. The evolution of this rate can be partly the result of the amount of waste of the resources and the odious debts. In fact, these debts are in major part loans agreed upon in favour of private people (close to the deposed president) never honoured and the State has agreed to be accountable for.

3.2. Indicator of governance quality: principal component analysis (ACP) method

The difficulties related to the measurement of governance quality have led us to choose a set of variables treated with a principal component analysis. In this way, we could not have a large number of variables that can reflect how institutions function and that can be measured.

3.2.1. Exploratory factorial analysis

Before applying a factorial analysis on data, we must analyse the correlation matrix. If a number of variables are correlated (> 0.5), then, factorization is possible. In the case, we are treating several variables are correlated as shown it table 1 of the appendix. Moreover, the measure of sampling adequacy approximates (0, 67) as shown it table 2 of the appendix. These two conditions prove that we have an adequate sample for a factorial analysis. To determine the number of factors to be retained, we have chosen Kaiser's rule. Kaiser's criterion makes it possible to extract n factors whose eigenvalue is higher than 1. The results of the factorial analysis show that the first factor by itself is responsible for 63% of the variance as shown it table

3 of the appendix. The variables "numbers of journals and scientific and technical articles", "contract intensive money" and "budget deficit compared to the budget expenditures" are well represented as shown it table 4 of the appendix. Whereas, the communality of the variable "foreign direct investment" is low (0, 43) compared to the other variables. Thus this variable has a saturation lower than 0,5. This variable is removed and conducted an new principal component analysis. The suppression of this variable allowed an information restitution of approximately 74% as shown in table 5 of the appendix. We focus more particularly on the factor 1 that indicates the highest marginal information restitution of (74%) as shown in table 6 of the appendix. In addition, the second and the third factor only explain a weak share of the variance (respectively 17, 06% and 9, 22% for the principal components 2 and 3). Moreover, variables: “numbers of journals and scientific and technical articles", and a “contract intensive money” are strongly and positively correlated with this component. Whereas, the variable "budget deficit compared to the public expenditure" is strongly and negatively correlated with this principal component as shown it table 7 of the appendix. Thus, these three variables affect this factor.

3. 2. 2. Confirmatory factor analysis

The confirmatory factor analysis makes it possible to confirm the factorial structure related to the data. So it enables us to consider the reliability[6] of internal coherence of the indicator and consequently the validity of this indicator. To evaluate the reliability of this indicator, we used the correlation "inter-variables" which represent the homogeneity and the consistency of the variables which constitute the indicator. The confirmatory factor analysis shows that the correlations "inter-variables" are satisfactory [7] as shown it in table 8 of the appendix.

4. Public governance quality and growth: Multivariate analysis

We try in what follows to quantify the effects of the governance quality indicator on growth in Tunisia.

4.1. Model construction and assumptions

[6] A measuring instrument is known as "reliable" if, we use it frequently we obtain the same result.

[7] Bearden and al. (1993) suggest that correlations inter-items higher than 0,3 are very satisfactory.

The goal of this analysis is to investigate the effect of the public governance variable on the growth. Model construction based on various theoretical and empirical studies (North 1991; Hall and Jones 1999 and Rodrik et al. 2004) which were related to the effect of governance quality on growth. Given that our dependent variable is the annual growth rate of gross domestic product per capita (PIBT) during the period 1980-2009. Indeed, Meisel and Ould Aoudia (2007) show that there is a correlation between good governance and income per capita. The independent variables are those of economic policies. Model estimation is exposed to a significant problem, which is the bidirectional causality. This problem led to bias in the estimation result. We suppose that the bias due to this problem is weak for various reasons. First, Kaufmann et al. (2005) show that a good governance increases growth and the relation of causality between the two is not circular. In other words, if good governance tends to promote economic growth, growth, does not necessarily improve governance. Second, we can use the instrumental variables as a solution to the bidirectional causality. It is neither easy to find the instruments nor to have data about these instruments. Third, the money spent to improve governance quality in Tunisia is less than the one spent to improve the human capital or the infrastructure. Consequently, we suppose that bias due to the bidirectional problem is weak.

In this context, we propose the following model:

$$PIBT = \gamma_0 + \gamma_1 d(INV) + \gamma_2 CAH + \gamma_3 (IQG(-2)) + \gamma_4 OUV + \gamma_5 INF + MA(1) + \varepsilon$$

Where:

$PIBT$ is the annual average growth rate of GDP/person

$d(INV)$ is investment rate (measured by the ratio $\frac{INV}{PIB}$);

CAH is literacy rate in the country (measured by the rate of the labour force having secondary schooling);

$IQG(-2)$ is *lagged public* governance quality variable ;

OUV is openness variable. It is measured by the ratio of the sum of imports and exports to GDP;

INF is inflation variable. It is measured by the annual growth rate of the GDP implicit deflator;

ε is the margin of error.

The estimate of this model by the least squares ordinary method gives the following results.

4.2. Results and interpretation

Table 1: Results of the estimate regression

Variables	Coefficients	(t-student)	Probabilities
C	11,7	3,45	0,00
$d(INV)$	0,73	3,47	0,00
CAH	0,10	3,34	0,00
$(IQG(-2))$	1,84	2,16	0,04
OUV	-0,19	-3,22	0,00
INF	0,51	1,98	0,06
$MA(1)$	-0,96	-75,36	0,00
$\overline{R}^2$ ajusté	0,74	-	-
F-Statistic	10,22	-	0,00
DW	2,41	-	-

(Data source: World Development Indicators, 1980-2009, World Bank www.brookings.edu/.../2010/0924_wgi_Kaufmann).

Public governance quality, statistically significant at the level of 4%, has a positive effect on economic growth and on income per capita. This result was confirmed by theoretical [North (1991 and 2005)] and empirical work [Kaufmann et al. (1996-2009)]. This work shows that good governance reflects a good quality of the public services offered which increase trust among individuals. Trust enhances cooperative coordination between individuals, reduces the costs of transaction and makes their effort more profitable. This result confirms the fact that the institution is a stock variable. Indeed, the lagged variable $(IQG(-2))$ affects growth positively. New institutional measurements can have effects only after a certain time necessary to the training and the assimilation of new institutional measurements (Favereau 1989).

Human capital has a positive and significant effect (at the level of 5%) on economic growth. This result confirms the works of Romer (1986) and Lucas (1988) which showed that human capital had a positive impact on the process of economic growth in long run.

Investment has a positive and significant effect (at the level of 0%) on economic growth. This result shows that any variation in investment rate positively affects economic growth. This confirms theoretical works since Harrod and Domar[8] .

Inflation has a positive and significant effect (at the level of 6%) on growth. This result confirms the work of Fisher (1993) which shows that inflation can affect the growth positively if its initial level is low (the case of Tunisia before 14 January 2011).

Openness has a negative and significant effect (at the level of 0%) on economic growth. Chadly Ayari (2011) considers that all the forms of openness are not necessarily virtuous. Indeed, the externalities generated by openness do not usually have a positive effect on economic growth. Certain external shocks such as financial crises in the European countries can reduce the positive effect of openness and thus reduce the rate of economic growth.

5. Conclusion and implication

Over the past two decades the international institutions (World Bank) has been very interested in developing governance indicators for many of countries. These indicators are standards and all countries should use it. The main objective of this study is to identify the reasons that favour the adoption of local governance indicators by the developing countries in particular Tunisia. In this framework, we seek to establish a local public governance indicator based on variables easy to measure and which can reflect public governance quality in Tunisia.

In applying a principal component analysis to a set of variables such as a number of journals and articles scientific and technical articles, contract intensive money and budget deficit compared to the budgetary expenditure, we prove that public governance quality affects economic growth.

According to our results, we come to the conclusion that financial policy, scientific research and the state policy spending are the main sector which reflect public governance quality. These results are in line with previous studies that have shown that these sectors affect economic growth (Meisel and Ould Aoudia, 2007).

[8] *Macroeconomics of Blanchard and Cohen.*

Our results are potentially important for Tunisia because they (our results) provide a better understanding of the variables that may reflect governance quality in the country. These results are also potentially useful for the Tunisia in its quest for a strategy to maximize the governance quality and the trust of Tunisian people in economic and social policy of their government.

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Appendix

Table 1: Correlation of the variables of the governance quality indicator

Correlations					
		Number of the newspapers and articles scientific and technical produced per year"	Contract-intensive money	Foreign direct investment	Budget deficit compared to the budgetary expenditure
"Number of the newspapers and articles scientific and technical produced per year"	Pearson Correlation	1	,639 **	,559 **	-, 491 **
	Sig. (2-tailed)		, 000	,001	,006
	N	30	30	30	30
Contract-intensive money	Pearson Correlation	, 639 **	1	,296	-, 683 **
	Sig. (2-tailed)	, 000		, 112	,000
	N	30	30	30	30
Foreign direct investment	Pearson Correlation	, 559 **	,296	1	-, 352
	Sig. (2-tailed)	, 001	,112		, 056
	N	30	30	30	30
Budget deficit compared to the expenditure budgetary	Pearson Correlation	-, 491 **	-, 683 **	-, 352	1
	Sig. (2-tailed)	, 006	,000	,056	
	N	30	30	30	30
** Correlation is significant At the 0.01 level (2-tailed).					

Table 2 :Test of KMO

KMO and Bartlett' S Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,67
Bartlett' S Test of Sphericity	Approx. Chi-public garden	31,54
	Df	3
	Sig.	, 000

Table 3: Original variance L E explained

Total Explained Variance						
Componen t	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	otal	% of Variance	Cumulative %
1	2,528	63,194	63,194	,528	63,194	63,194
2	, 801	20,022	83,216			
3	, 442	11,046	94,263			
4	, 229	5,737	100,000			
Method Extraction: The Main thing Component Analysis.						

Table 4: Representation quality

Communalities		
	Initial	Extraction
Number of the newspapers and articles scientific and technical produced per year	1,000	,729
Foreign direct investment	1,000	,438
Contract-intensive money	1,000	,714
Budget deficit compared to the expenditure budgetary	1,000	,647
Method Extraction: The Main thing Component Analysis.		

Table 5 : Representation quality

Communalities		
	Initial	Extraction
Number of the newspapers and articles scientific and technical produced per year	1,000	,674
Contract-intensive money	1,000	,825
Budget deficit compared to the expenditure budgetary	1,000	,713
Method Extraction: The Main thing Component Analysis.		

Table 6: Explained original variance

Total Explained Variance						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,212	73,718	73,718	2,212	73,718	73,718
2	, 512	17,061	90,780			
3	, 277	9,220	100,000			
Method Extraction: The Main thing Component Analysis.						

Table 7: Stamp components

Component Matrix [has]	
	Component
	1
Number of the newspapers and articles scientific and technical produced per year	, 821
Contract-intensive money	, 908
Budget deficit compared to the expenditure budgetary	-, 844
Method Extraction: The Main thing Component Analysis.	
a. 1 components extracted.	

Table 8: Correlation between the variables

Correlations					
		Number of the newspapers and articles scientific and technical produced per year	Contract-intensive money	Budget deficit compared to the expenditure budgetary	REGR Factor score 1 for analysis 31 (IQG)
Number of the newspapers and articles scientific and technical produced per year	Pearson Correlation	1	,639 **	-, 491 **	,821 **
	Sig. (2-tailed)		, 000	,006	,000
	N	30	30	30	30
Contract-intensive money	Pearson Correlation	, 639 **	1	-, 683 **	,908 **
	Sig. (2-tailed)	, 000		, 000	,000
	N	30	30	30	30
Budget deficit compared to the expenditure budgetary	Pearson Correlation	-, 491 **	-, 683 **	1	-, 844 **
	Sig. (2-tailed)	, 006	,000		, 000
	N	30	30	30	30
REGR Factor score 1 for analysis 31 (IQG)	Pearson Correlation	, 821 **	,908 **	-, 844 **	1
	Sig. (2-tailed)	, 000	,000	,000	
	N	30	30	30	30
** Correlation is significant At the 0.01 level (2-tailed).					

Table 9: Descriptive statistics of the governance quality indicator

Descriptive Statistics								
	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
REGR Factor score 1 for analysis 31 (IQG)	30	-1,85758	1,83112	,0000000	1,00000000	1,000	-, 734	,833
Valid N (listwise)	30							

Table 10: Result of estimation

Variable Dependent: PIBT				
Method: Least Public gardens				
Date: 12/09/11 Time: 10:53				
Sample (adjusted):1982 2009				
Included observations: 28 after adjustments				
Convergence achieved after 10 iterations				
Backcast: 1981				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INV)	0.730668	0.210564	3.470045	0.0023
CAH	0.108341	0.032432	3.340534	0.0031
IQG (-2)	1.847194	0.852913	2.165748	0.0420
OUV	-0.195007	0.060411	-3.228019	0.0040
INF	0.519020	0.261255	1.986638	0.0602
C	11.70068	3.387567	3.454006	0.0024
MA(1)	-0.961917	0.012764	-75.36238	0.0000
R-squared	0.744979	Mean dependent VAr		2.607143
Adjusted R-squared	0.672115	S.D. dependent VAr		2.739820
S.E. of regression	1.568854	Akaike information criterion		3.950886
Sum squared resid	51.68735	Schwarz criterion		4.283937
Log likelihood	-48.31240	F-statistic		10.22434
Durbin-Watson stat	2.418665	Prob(F-statistic)		0.000025
Inverted MA Roots	96			