



## *Good Governance and Poverty Alleviation: Focusing on the role of Economic Growth and Income Inequality*

Nadjet Ouis\* <sup>(1)</sup>

nadjet.ouis@univ-saida.dz

Saida University, (Algeria)

Youcef Souar <sup>(3)</sup>

syoucef12@yahoo.fr

Saida University, (Algeria)

Djelloul Cherifi <sup>(2)</sup>

djelloul.cherifi14@gmail.com

Saida University, (Algeria)

Latifa Ouis <sup>(4)</sup>

ouislatifa20121988@gmail.com

Algiers 3 University, (Algeria)

Received : 09/05/2023

Accepted : 07/06/2023

Published : 11/06/2023

### *Abstract*

This study aims to identify the impact of good governance on the growth, inequality, and poverty triangle in Arab countries. and in order to do so, a structural model with simultaneous equations was developed, as the study covered the period from 1996 to 2016. The three-stage least squares method was used to estimate the model.

Based on Stata 15 outputs, it was determined that the good governance indicators of corruption control, and participation and accountability have a negative and direct effects on the prevalence of poverty, whereas the other indicators of government effectiveness, political stability, regulatory quality, and the rule of law affect the poverty rate indirectly through economic growth. The study also discovered a statistically significant negative relationship between the economic growth and the income inequalities.

**Keywords :** Good Governance, Economic Growth, Income Inequality, Poverty.

\* Nadjat Ouis, ITMAM Laboratory, Saida University – Dr. Moulay Tahar (Algeria), [orcid.org/0000-0003-0069-8755](https://orcid.org/0000-0003-0069-8755).

## **1. INTRODUCTION**

In September 2000, delegates from all over the world assembled to address poverty reduction in developing countries. The United Nations (UN) adopted the Millennium Declaration, in which all 189 member states, including 147 heads of state and government, pledged to do their best to help those suffering from poverty, hunger, and disease. However, A number of experts have stated that aid projects can only be successful if they are accompanied by good policies and institutions (Bank, 1998). Likewise, After the IMF and World Bank's structural adjustment policies failed in the 1980s and 1990s, the strategy of good governance became critical for poverty reduction (Grindle, 2004). Therefore, **What effect does good governance have on poverty reduction in Arab countries ?**

Many studies have shown that economic growth reduces poverty while income inequality increases it. Also the recent literature on the determinants of growth emphasizes the importance of governance quality as a stimulus for a country's economic growth. Similarly, studies that look at the relationship between good governance and income inequality frequently find a negative and significant link between the two.

According to the above, the answer to the preceding question leads us to develop two hypotheses which can be formulated as follows :

- Good Governance has a direct impact on poverty.
- Good Governance affects poverty through the economic growth and the income inequality.

## **2. THE RELATIONSHIP BETWEEN GROWTH – INEQUALITY - POVERTY TRIANGLE AND GOOD GOVERNANCE (LITERATURE REVIEW)**

- The first theoretical foundation focusing on the relationship between the economic growth and income inequalities is the (Kuznets, 1955) hypothesis, which was developed in 1955. It was based on a curvilinear relationship between growth and incomes inequality. This inverted u-curve illustrates the idea that as income rises,

inequality rises, peaks, and then falls for the rest of the time (transition from a low-productivity agricultural economy to a high-productivity industrial economy).

- (Persson & Tabellini, 1994) investigated the relationship between economic growth and income inequalities using a sample of 56 countries from 1960 to 1985. They used the ordinary least squares method to regress growth on income equality. They concluded that only in democratic countries does the positive relationship between economic growth and equality have a significant impact.

- (Barro, 2000) studied the relationship between the average growth rate of real GDP per capita and income inequality (the Gini index) using panel data from countries at various stages of development. His research spanned three decades: 1965 to 1975, 1975 to 1985, and 1985 to 1995. and the three-stage least squares method was used to estimate the study model. He used the rule of law, democracy, the rate of inflation, and the ratio of public consumption to GDP as explanatory variables. He discovered a very weak relationship between growth and democracy measurement and he concluded that inequality stimulates economic growth in rich countries while it slows growth in poor countries.

- (Kaufmann & Kraay, 2002) examined the relationship between good governance and economic growth using six governance indicators. They concluded that per capita income and governance quality are significantly, strongly, and positively correlated across countries. Thus, better governance leads to an increase in per capita income, whereas poor governance leads to the opposite effect.

- (Bourguignon, 2004) Coined the term “Triangle” to describe the relationship between poverty, inequality and economic growth. He emphasized the importance of maintaining redistribution as a complementary component of growth in order to achieve a remarkable reduction in the level of poverty, both in the short and long term.

- (Dincer & Gunalp, 2008) looked at how corruption affects income inequality and poverty. And by examining the case of the United States from 1981 to 1997, they

discovered a strong evidence that increased corruption increases income inequality and poverty.

- (Guiga & Ben Rejeb, 2012) used a system of simultaneous equations to conduct an econometric analysis using panel data from 52 developing countries from 1990 to 2005 to determine the main sources of poverty reduction and show the interdependence between poverty, inequality, and growth. The results revealed that state investment in social sectors such as education, health, and improving rural people's living conditions can promote economic growth and reduce inequality. According to the researchers, the Kuznets hypothesis was also validated in their study sample.

- (Anyanwu, 2013) sought to investigate both the various factors that contribute to poverty as well as the political changes that can reduce the incidence of poverty in Africa and accelerate inclusive growth. He collected data from 43 African countries spanning the years 1980 to 2011. The study revealed that socioeconomic strategies and policies that promote inclusive growth help to accelerate the process of poverty reduction in Africa, and democracy acting through various channels can have both positive and negative implications for improving the growth-poverty relationship.

- The (Kwon & Kim, 2014) study aimed to examine the policy logic that good governance leads to poverty reduction, which has been adopted by international organizations in their pursuit of the MDGs. This causal relationship was investigated using an empirical panel-data estimation with Worldwide Governance Indicators and the poverty headcount ratio in 98 countries. The findings revealed that only in middle-income countries does good governance alleviate poverty. Furthermore, the region-specific analysis revealed that good governance has no significant impact on poverty reduction in either South Asia or Sub-Saharan Africa. Given that both regions have experienced social and economic development in recent decades, this finding can be attributed to structural inequality that excludes the poor and impedes inclusive growth.

- (Akobeng, 2016) focused on the impact of GDP per capita and sectoral growth on poverty, and he examined how institutions can strengthen the growth-poverty link.

He used the GMM method and a panel dataset of 41 Sub-Saharan African countries from 1981 to 2010. He discovered that increasing GDP per capita is an important tool for poverty reduction. Furthermore, the expansion of agriculture and the service sectors has a direct impact on poverty reduction. This research also revealed that good governance, bureaucratic quality, effective policies, and adequate regulations are critical components in maintaining the growth-poverty nexus in Sub-Saharan Africa.

### 3. METHODOLOGY

We use a structural model with simultaneous equations to investigate the simultaneous interaction of economic growth and inequality, as well as to add a third equation that measures poverty. This approach distinguishes between the direct and indirect effects of good governance indicators on poverty via economic growth and income inequality.

The purpose of our empirical research is to identify the factors that define poverty. Therefore, we create a model with three equations: the first explains the economic growth (Barro, 2000) (Kaufmann & Kraay, 2002), the second discusses income inequalities (Kuznets, 1955) (Deininger & Squire, 1998) and the third describes poverty (Bourguignon, 2004) (Dollar & Kraay, 2002; Ravallion, 2001).

These three equations are estimated in order to introduce the various relationships between endogenous variables, whereas good governance variables are thought to be exogenous (the integration of governance indicators into the equations of inequality and poverty is based on a review of the literature). For the variables specific to each equation, we introduce a set of indicators according to the theoretical objectives of each of the three equations.

The system of simultaneous equations is written as follows:

$$\begin{cases} GDP_{per\ capita_{it}} = \alpha_0 + \alpha_1 Gini_{it} + \alpha_2 Gov_{it} + \alpha_3 A_{it} + \varepsilon_{1it} \\ Gini_{it} = \beta_0 + \beta_1 GDP_{per\ capita_{it}} + \beta_2 Gov_{it} + \beta_3 B_{it} + \varepsilon_{2it} \\ IPov_{it} = \gamma_0 + \gamma_1 GDP_{per\ capita_{it}} + \gamma_2 Gini_{it} + \gamma_3 Gov_{it} + \gamma_4 C_{it} + \varepsilon_{3it} \end{cases}$$

With:  $i=1, \dots, 7$  (7 of Arab Countries)  $t=1996 \dots 2016$

$GDP_{per\ capita_{it}}$ ,  $Gini_{it}$ ,  $IPov_{it}$ ,  $Gov_{it}$  are the per capita gross domestic product, the Gini index, the poverty incidence and the good governance indicators, respectively.

$A_{it}$ ,  $B_{it}$ ,  $C_{it}$ : is the vector of the variables specific to each equation.

$\varepsilon_{1it}$ ,  $\varepsilon_{2it}$  and  $\varepsilon_{3it}$ : are the error terms.

**Table 1.** Variables and data sources

Variables	Sources <sup>1</sup>
GDP per capita constant 2005	World Development Indicators
Gini index	PovcalNet database (World Bank)
Poverty headcount ratio at \$1.90 a day	
Control of Corruption	Worldwide Governance Indicators
Government Effectiveness	
Political Stability and Absence of Violence/Terrorism	
Regulatory Quality	
Rule of Law	
Voice and Accountability	
School enrollment, secondary (% gross)	World Development Indicators
Trade Openness	
Foreign direct investment	
Inflation, consumer prices (annual %)	
Domestic general government health expenditure	
Population growth (annual %)	
Unemployment, total (% of total labor force)	

**Source:** Authors own construction

The resolution of the simultaneous equations model requires verification of the model identification conditions: the order conditions and the rank conditions. The rank condition is a necessary and sufficient condition for identification, but it is difficult, if

<sup>1</sup> We note that some countries have missing data, so the panel is not cylindereed and will be annualized later. This data annualization technique is based on calculating the average annual growth rate over a period framed by two observations in the initial base.

not impossible, to implement in practice, that is why researchers are most often satisfied with order conditions that are determined equation by equation (Bourbonnais, 2018).

To implement this test, we proceed as follows: (Bourbonnais, 2018)

Where:

$g$ : the number of endogenous model variables (or number of model equations).

$k$ : the number of exogenous model variables.

$g'$ : the number of endogenous variables included in an equation.

$k'$ : the number of exogenous variables included in an equation.

The necessary conditions of identification are as follows:

$g-1 > g-g'+k-k' \rightarrow$  the equation is under-identified

$g-1 = g-g'+k-k' \rightarrow$  the equation is just identified

$g-1 < g-g'+k-k' \rightarrow$  the equation is over-identified

Our model has three equations,  $g=3$  (which are GDP percapita, Gini, and IPOV),  $k=8$  (the governance indicator selected<sup>2</sup> and 7 control variables).

First equation:  $g'=2$ ,  $k'=5$  and  $g-1 < g-g'+k-k'$  : the equation is therefore over-identified.

Second equation:  $g'=2$ ,  $k'=4$  and  $g-1 < g-g'+k-k'$  : the equation is therefore over-identified.

Third equation:  $g'=3$ ,  $k'=4$  and  $g-1 < g-g'+k-k'$  : the equation is therefore over-identified.

In conclusion the model is over-identified. In this case, we will estimate it using the triple least squares method which allows to take into account the autocorrelation and the heteroscedasticity issues while also providing efficient estimators (Bourbonnais, 2018).

---

<sup>2</sup> The correlation matrix shows that there is a strong correlation between the good governance indicators themselves, so we will introduce them one by one.

#### 4. EMPIRICAL RESULTS (ANALYSIS AND DISCUSSION)

##### **Convergent validity:**

The convergent validity refers to how closely one measure of a construct relates to other measures of the same underlying construct. It is useful to consider the low value of root mean square error (RMSE) that is unique to each measure when judging the degree of convergence between two measures in 3SLS (Nichols, 2007).

##### **Discriminant validity:**

The high  $R^2$  value indicates that all of the independent variables in the 3SLS model are critical and distinct to the performance of the dependent variable in order to establish the discriminant validity. A negative  $R^2$  in 3SLS indicates that the structural model predicts the dependent variable worse than a constant-only model (Greene, 2012).

##### **Nomological validity for predictive theoretical modeling:**

The nomological validity necessitates the identification of a network of key constructs associated with the phenomenon of interest in order to explain the pattern of interrelationship that should exist between them. The overall model significance is seen as important for establishing nomological validity without any noticeable collinearity. The obtained data patterns match theoretical predictions, as demonstrated by nomological validity (Zellner & Theil, 1962).

#### 4.1 RESULTS OF THE FIRST REGRESSION ESTIMATION

We find RMSE values between 0 and 1, the convergent validity is established (see Table 2). Likewise, because of the positive  $R^2$  in 3SLS, the discriminant validity can be established (see Table 2). Furthermore, a significant overall model contributes to the establishment of nomological validity in predictive theoretical modeling (see Table 2).



**Table 2.** Estimation Results (control of corruption)

Equation	RMSE	R-Square	Probability
<b>lnGDPpercapita</b>	0.2250586	0.6004	0.0000
<b>lnGiniindex</b>	0.0712755	0.5006	0.0000
<b>lnPoverty</b>	0.6188762	0.7310	0.0000
	<b>Coefficient<sup>3</sup></b>		<b>Probability</b>
<b>lnGDPpercapita</b>			
Control of corruption	0.2652932***		0.000
lnGiniindex	-3.190994***		0.000
lnschool	0.2651614***		0.000
Opening trade	0.7103041***		0.000
Investment	-0.0131772***		0.000
Inflation	-0.0019129		0.496
constant	17.9081***		0.000
<b>lnGiniindex</b>			
Control of corruption	0.072008***		0.000
lnGDPpercapita	-0.1933725***		0.000
Opening trade	0.1869797***		0.000
Inflation	-0.0016741		0.161
Investment	-0.0029754**		0.018
constant	5.01942***		0.000
<b>lnPoverty</b>			
Control of corruption	-0.4583635**		0.039
lnGDPpercapita	-2.665732***		0.000
lnGiniindex	-2.052879		0.171
Lnunemployment	0.3814906**		0.018
Health	-0.0869026		0.256
Population growth	-0.0478503		0.362
Constant	28.68736***		0.000

**Source:** Created by authors using Stata 15 outputs

<sup>3</sup> The symbols \*, \*\*, \*\*\* denote 10%, 5%, and 1% significance levels, respectively.

The analysis of the GDP per capita equation shows that: first, the corruption control variable has a positive and significant effect on economic growth. Several empirical studies show that corruption either directly or indirectly (for example, through the investment channel) harms economic growth. Similarly, corruption control creates an economic environment favorable to productivity, and, as a result, stimulates economic growth.

Second, the inequality has a negative and statistically significant effect on GDP per capita at 1%. This finding is consistent with (Alesina & Rodrik, 1994) study, which discovered a negative relationship between the GNP per capita growth rate and the Gini index.

For the control variables, we note the statistical significance of trade openness and education which positively affect the per capita GDP.

For the second equation, it should be noted that the corruption control variable does not have the expected sign, despite the fact that it is statistically significant.

Also, we notice that the GDP per capita has a statistically significant expected sign.

The findings of the third equation estimates show that the control of corruption has a negative and significant effect on the incidence of poverty. In fact, the fight against corruption, respect for the law and protection of property rights allow the poor to access opportunities and escape poverty (Gupta, Davoodi, & Alonso-Terme, 2002).

Furthermore, the GDP per capita has a negative and statistically significant effect on the incidence of poverty. The economic growth is therefore an important factor in reducing poverty in Arab countries. (Dollar & Kraay, 2002) Support also that growth is good for the poor.

The Gini index has an unexpected and insignificant impact on poverty incidence.

In addition, the effect of unemployment on the incidence of poverty is positive and statistically significant at 5%. Several empirical studies demonstrate that these two variables have a positive relationship.

## 4.2 RESULTS OF THE SECOND REGRESSION ESTIMATION

We find RMSE values between 0 and 1, the convergent validity is established (see Table 3). Likewise, because of the positive R2 in 3SLS, the discriminant validity can be established (see Table 3). Furthermore, a significant overall model contributes to the establishment of nomological validity in predictive theoretical modeling (see Table 3).

**Table 3.** Estimation results (government effectiveness)

Equation	RMSE	R-Square	Probability
<b>lnGDPpercapita</b>	0.2444926	0.5284	0.0000
<b>lnGiniindex</b>	0.0654562	0.5788	0.0000
<b>lnPoverty</b>	0.6685488	0.6861	0.0000
	<b>Coefficient</b>		<b>Probability</b>
<b>lnGDPpercapita</b>			
Government Effectiveness	0.3446126***		0.000
lnGiniindex	-3.764882***		0.000
lnschool	0.1647959***		0.000
Opening trade	0.8020708***		0.000
Investment	-0.0142035***		0.000
Inflation	-0.0004528		0.887
constant	20.29182***		0.000
<b>lnGiniindex</b>			
Government Effectiveness	0.0889871***		0.000
lnGDPpercapita	-0.2054743***		0.000
Opening trade	0.1918983***		0.000
Inflation	-0.0009522		0.400
Investment	-0.0029391**		0.013
constant	5.105952***		0.000
<b>lnPoverty</b>			
Government Effectiveness	0.1357203		0.540
lnGDPpercapita	-2.785913***		0.000
lnGiniindex	-2.957133*		0.065
Lnunemployment	0.4867032**		0.011
Health	-0.1759113**		0.044
Population growth	-0.0551052		0.314
Constant	33.06974***		0.000

**Source:** Created by authors using Stata 15 outputs

For the first equation, the table above shows that the government effectiveness affects positively the economic growth. This positive effect validates (Kaufmann & Kraay, 2002) work. Similarly, Many Arab countries have unexploited natural resources, thus the existence of an effective government (proper management of state revenues and expenditures, higher quality of services provided by the public administration, and high qualifications of State staff) can stimulate economic growth.

The Gini index has a statistically significant negative effect on GDP per capita.

Furthermore, we find that the trade openness is positively correlated with the GDP per capita at 1% of significance. Indeed, (Karras, 2003) showed that increasing trade (exports plus imports) as a percentage of GDP by 10 percentage points raises the real growth rate of GDP per capita by 0.25 to 0.3 percent indefinitely.

For the second equation, we note that the government effectiveness variable does not have the expected sign, despite the fact that it is statistically significant.

Also, we notice that the GDP per capita has a statistically significant expected sign.

For the third equation, it appears that the government effectiveness has not a direct effect on the poverty reduction in Arab countries during the study period.

Furthermore, GDP per capita has a statistically significant negative effect on the prevalence of poverty.

The inequality has an unexpected impact on poverty incidence.

On the other hand, the government health expenditure reduces poverty by 17%. This effect has a statistical significance at 5%.

#### **4.3 RESULTS OF THE THIRD REGRESSION ESTIMATION**

We find RMSE values between 0 and 1, the convergent validity is established (see Table 4). Likewise, because of the positive R<sup>2</sup> in 3SLS, the discriminant validity can be established (see Table 4). Furthermore, a significant overall model contributes to the establishment of nomological validity in predictive theoretical modeling (see Table 4).

**Table 4.** Estimation results (political stability and absence of violence/terrorism)

Equation	RMSE	R-Square	Probability
<b>lnGDPpercapita</b>	0.2417996	0.5387	0.0000
<b>lnGiniindex</b>	0.0720469	0.4897	0.0000
<b>lnPoverty</b>	0.6880019	0.6676	0.0000
	<b>Coefficient</b>		<b>Probability</b>
<b>lnGDPpercapita</b>			
Political stability	0.097511***		0.000
lnGiniindex	-3.356569***		0.000
lnschool	0.3187526***		0.000
Opening trade	0.8938197***		0.000
Investment	-0.0120068***		0.000
Inflation	-0.003733		0.226
constant	18.1166***		0.000
<b>lnGiniindex</b>			
Political stability	0.0307044***		0.001
lnGDPpercapita	-0.164451***		0.000
Opening trade	0.2158015***		0.000
Inflation	-0.0019107		0.121
Investment	-0.0024472**		0.047
constant	4.760657***		0.000
<b>lnPoverty</b>			
Political stability	-0.0554216		0.617
lnGDPpercapita	-3.037084***		0.000
lnGiniindex	-3.226134**		0.020
Lnunemployment	0.32293*		0.097
Health	-0.0984545		0.280
Population growth	-0.0658362		0.240
Constant	36.18562***		0.000

**Source:** Created by authors using Stata 15 outputs

The estimation results of the first equation show that the indicator of the political stability and absence of violence/terrorism affects positively the GDP per capita. Indeed, the political stability creates a favorable environment for growth.

The GDP per capita is negatively affected by the Gini index in a statistically significant way.

In addition, the trade openness plays a critical role in stimulating economic growth.

For the second equation, it should be noted that the political stability variable does not have the expected sign, despite the fact that it is statistically significant.

However, we can see that the negative impact of GDP per capita is statistically significant.

Regarding the third equation, the analysis reveals that the coefficient of the political stability variable is insignificant, implying that political stability does not directly reduce poverty.

Furthermore, the effect of the GDP per capita on the poverty incidence is negative and statistically significant.

In contrast, the income inequality has a significant impact on poverty incidence at 5%, but it does not have the expected sign.

#### **4.4 RESULTS OF THE FOURTH REGRESSION ESTIMATION**

We find RMSE values between 0 and 1, the convergent validity is established (see Table 5). Likewise, because of the positive R<sup>2</sup> in 3SLS, the discriminant validity can be established (see Table 5). Furthermore, a significant overall model contributes to the establishment of nomological validity in predictive theoretical modeling (see Table 5).

**Table 5.** Estimation results (regulatory quality)

Equation	RMSE	R-Square	Probability
<b>lnGDPpercapita</b>	0.1873112	0.7232	0.0000
<b>lnGiniindex</b>	0.0650754	0.5837	0.0000
<b>lnPoverty</b>	0.5789265	0.7646	0.0000
	<b>Coefficient</b>		<b>Probability</b>
<b>lnGDPpercapita</b>			
Regulatory quality	0.2816099***		0.000
lnGiniindex	-2.777253***		0.000
Lnschool	0.3320341***		0.000
Opening trade	0.7016751***		0.000
Investment	-0.0155834***		0.000
Inflation	-0.0012376		0.640
Constant	16.15757***		0.000
<b>lnGiniindex</b>			
Regulatory quality	0.10156***		0.000
lnGDPpercapita	-0.1905364***		0.000
Opening trade	0.197238***		0.000
Inflation	-0.0013366		0.246
Invstment	-0.0046767***		0.000
Constant	4.9986669***		0.000
<b>lnPoverty</b>			
Regulatory quality	-0.3106351		0.201
lnGDPpercapita	-1.852014***		0.000
lnGiniindex	-0.3157839		0.849
Lnunemployment	0.5615666***		0.001
Health	-0.3179701***		0.001
Population growth	0.0363247		0.574
Constant	16.06831*		0.093

**Source:** Created by authors using Stata 15 outputs

According to the first equation's findings, the quality of regulations is critical for economic growth because it has an influence on it at the 1% level of significance.

There is a negative relationship between the GDP per capita and the Gini index. Furthermore, the inequality reduction promotes economic growth.

Moreover, the education as measured by school enrollment secondary rates, has a positive impact on economic growth. (Ali, Chaudhry, & Farooq, 2012) have found that high school enrollment rates stimulate growth.

For the second equation, it should be noted that, despite being statistically significant, the regulatory quality variable does not have the expected sign.

However, we can see that the GDP per capita has a statistically significant negative impact.

We can conclude by looking at the results of the third equation, that the relationship between the quality of regulations and the incidence of poverty is statistically insignificant, even if the link is negative, implying that improving the quality of regulations can indirectly reduce poverty.

In contrast, the effect of the GDP per capita on the poverty incidence is negative and statistically significant.

On the other hand, the Gini index coefficient lacks the expected sign and has no statistical significance.

In terms of control variables, we can see that the unemployment and the government health expenditure are both significant at 1%, such they exhibit the expected signs. Indeed, without the unlikely rapid development of large labor-absorbing industries, the fast-growing population will not only exacerbate poverty but may also exacerbate conflicts (particularly over natural resources), environmental degradation, diseases, food insecurity, and of course political instability.

#### **4.5 RESULTS OF THE FIFTH REGRESSION ESTIMATION**

We find RMSE values between 0 and 1, the convergent validity is established (see Table 6). Likewise, because of the positive R<sup>2</sup> in 3SLS, the discriminant validity can



be established (see Table 6). Furthermore, a significant overall model contributes to the establishment of nomological validity in predictive theoretical modeling (see Table 6).

**Table 6.** Estimation results (rule of law)

Equation	RMSE	R-Square	Probability
<b>lnGDPpercapita</b>	0.2039598	0.6718	0.0000
<b>lnGiniindex</b>	0.0700521	0.5176	0.0000
<b>lnPoverty</b>	0.6352418	0.7166	0.0000
	Coefficient		Probability
<b>lnGDPpercapita</b>			
Rule of law	0.1892586***		0.000
lnGiniindex	-2.877027***		0.000
lnschool	0.2719986***		0.000
Opening trade	0.8135951***		0.000
Investment	-0.0150093***		0.000
Inflation	0.0003961		0.888
constant	16.6466***		0.000
<b>lnGiniindex</b>			
Rule of law	0.0624034***		0.000
lnGDPpercapita	-0.2126494***		0.000
Opening trade	0.2362236***		0.000
Inflation	-0.0008284		0.499
Investment	-0.0039936***		0.002
constant	5.131603***		0.000
<b>lnPoverty</b>			
Rule of law	-0.209802		0.155
lnGDPpercapita	-2.417709***		0.000
lnGiniindex	-2.147748		0.106
Lnunemployment	0.3459405**		0.048
Health	-0.1963725**		0.019
Population growth	-0.0236386		0.662
Constant	27.48368***		0.000

**Source:** Created by authors using Stata 15 outputs

The results of the growth equation estimation show two major links: first, the rule of law stimulates economic growth by 19%. This effect has a statistical significance at 1%. Then, inequality reduces growth by a coefficient of -2.87.

The second estimated equation illustrates that the rule of law has a significant impact on income inequality, but it is a positive effect, which contradicts the economic theory.

By contrast, we can see that the GDP per capita has a statistically significant negative impact.

Concerning the third equation, and in terms of the rule of law, its impact is statistically insignificant, despite its negative impact on poverty.

The GDP per capita has a negative and statistically significant effect on poverty incidence.

The Gini index coefficient, on the other hand, lacks the expected sign and is statistically insignificant.

#### **4.6 RESULTS OF THE SIXTH REGRESSION ESTIMATION**

We find RMSE values between 0 and 1, the convergent validity is established (see Table 7). Likewise, because of the positive R<sup>2</sup> in 3SLS, the discriminant validity can be established (see Table 7). Furthermore, a significant overall model contributes to the establishment of nomological validity in predictive theoretical modeling (see Table 7).

**Table 7.** Estimation results (voice and accountability)

Equation	RMSE	R-Square	Probability
<b>lnGDPpercapita</b>	0.2501962	0.5061	0.0000
<b>lnGiniindex</b>	0.0761948	0.4293	0.0000
<b>lnPoverty</b>	0.6627982	0.6915	0.0000
	<b>Coefficient</b>		<b>Probability</b>
<b>lnGDPpercapita</b>			
Voice and accountability	0.0862136*		0.097
lnGiniindex	-3.330503***		0.000
lnschool	0.3096834***		0.000
Opening trade	0.8229312***		0.000
Investment	-0.0062808		0.036
Inflation	-0.0093015***		0.001
constant	18.12304***		0.000
<b>lnGiniindex</b>			
Voice and accountability	0.0243376		0.276
lnGDPpercapita	-0.1690776***		0.000
Opening trade	0.192953***		0.000
Inflation	-0.0036751***		0.001
Investment	-0.0004398		0.720
constant	4.814383***		0.000
<b>lnPoverty</b>			
Voice and accountability	-0.5053248**		0.013
lnGDPpercapita	-3.02312***		0.000
lnGiniindex	-3.102828**		0.022
Lnunemployment	0.3959791**		0.014
Health	-0.0770959		0.356
Population growth	-0.0649531		0.237
Constant	35.00793***		0.000

**Source:** Created by authors using Stata 15 outputs

According to the table above, we can see that the effect of voice and accountability on GDP per capita is positive and statistically significant at 10%. effectively, economic growth is improving as a result of civil society's participation in political life and contributions to civil and human rights.

Likewise, the income equality increases economic growth by a factor of 3.33.

Also, the school enrollment has a positive and significant impact on the gross domestic product per capita. Effectively, Secondary and higher education are more relevant for economic growth than primary education because they reinforce and build on knowledge gained in primary school and provide essential skills for the labor market.

The estimation of the inequality equation indicates that the Gini index is unaffected by the voice and accountability indicator.

On the other hand, 1% increase in GDP per capita results in a 17% decrease in income disparities.

The third equation demonstrates that improving good governance quality through accountability and citizen participation in political life has reduced poverty in Arab countries by 50%, during the period 1996-2016.

Also, when growth rates are high, poverty rates fall. (Dollar & Kraay, 2002) study confirmed this.

Furthermore, the Gini index coefficient does not have the expected sign despite being statistically significant at 5%.

## **5. CONCLUSION**

To better understand the mechanism of poverty reduction, we estimate the relationship between good governance and growth-inequality-poverty triangle, using regressions performed on panel data from 7 Arab countries from 1996 to 2016.

The following are the main findings from the regressions:

- Economic growth and income inequality have a significant negative relationship.
- Good governance in all of its dimensions promotes economic growth, which reduces the prevalence of poverty.
- In general, the effects of good governance indicators on income inequalities are weak.
- Corruption control, as well as voice and accountability, have a direct impacts on poverty. Controlling corruption is an essential component of poverty alleviation. Similarly, Democracy gives the poorest members of society access to decision-making.
- The Worldwide Governance Indicators that influence poverty through economic growth include government effectiveness, political stability, regulatory quality, and the rule of law.

## 6. Bibliography List :

- Akobeng, E. (2016). Growth and Institutions: A Potential Medicine for the Poor in Sub-Saharan Africa. *African Development Review*, 28(1), 1-17.
- Alesina, A., & Rodrik, D. (1994). Distributive Politics and Economic Growth. *The Quarterly Journal of Economics*, 109(2), 465-490. doi:10.2307/2118470
- Anyanwu, J. (2013). Determining the Correlates of Poverty For Inclusive Growth In Africa. *Working Paper Series*(181), 1-24.
- Bank, W. (1998). *Assessing Aid: What Works, What Doesn't and Why*. Retrieved from Washington:
- Barro, R. (2000). Inequality and Growth in a Panel of Countries. *Journal of Economic Growth*, 5, 5-32.
- Bourbonnais, R. (2018). *Econométrie*. Paris: Dunod.
- Bourguignon, F. (2004). Le Triangle Pauvreté - Croissance - Inégalités. *Afrique contemporaine*(211), 29-56.
- Deininger, K., & Squire, L. (1998). New Ways of Looking at old issues: Inequality and Growth. *Journal of Development Economics*, 57, 259-287.
- Dincer, O., & Gunalp, B. (2008). Corruption, Income Inequality, and Poverty in the United States. *Fondazione Eni Enrico Mattei*, 54, 1-36.
- Dollar, D., & Kraay, A. (2002). Growth is Good for the Poor. *Journal of Economic Growth*, 1-43.
- Greene, W. (2012). *Econometric Analysis*. New Jersey: Prentice Hall.
- Grindle, M. (2004). Good Enough Governance: Poverty Reduction and Reform in Developing Countries. *Governance*, 17(4), 525-548.
- Guiga, H., & Ben Rejeb, J. (2012). Poverty, Growth and Inequality in Developing Countries. *International Journal of Economics and Financial Issues*, 2(4), 470-479.
- Gupta, S., Davoodi, H., & Alonso-Terme, R. (2002). Does corruption affect income inequality and poverty? *Economics of Governance*, 3, 23-45.
- Kaufmann, D., & Kraay, A. (2002). Growth without Governance. *Policy Research Working Paper*(2928), 1-53.
- Kuznets, S. (1955). Economic Growth and Income Inequality. *The American Economic Review*, 45(1), 1-28.
- Kwon, H.-j., & Kim, E. (2014). Poverty Reduction and Good Governance: Examining the Rationale of the Millennium Development Goals. *Development and Change*, 45(2), 353-375.
- Nichols, A. (2007). Causal inference with observational data. *Stata Journal*, 7(4), 507-541.
- Persson, T., & Tabellini, G. (1994). Is Inequality Harmful for Growth? *The American Economic Review*, 84(3), 600-621.
- Ravallion, M. (2001). Growth, Inequality and Poverty: Looking Beyond Averages. *World Development*, 29(11), 1803-1815. doi:[https://doi.org/10.1016/S0305-750X\(01\)00072-9](https://doi.org/10.1016/S0305-750X(01)00072-9)
- Zellner, A., & Theil, H. (1962). Three-Stage Least Squares: Simultaneous Estimation of Simultaneous Equations. *Econometrica*, 30(1), 54-78.

## 7. Appendices

**Fig 1.** Estimation Results (control of corruption)

Three-stage least-squares regression

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
lnGDPpercapita	147	6	.2250586	0.6004	683.28	0.0000
lnGiniindex	147	5	.0712755	0.5006	153.76	0.0000
lnPoverty	147	6	.6188762	0.7310	464.69	0.0000

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
lnGDPpercapita						
ControlofCorruptionestimate	.2652932	.0455796	5.82	0.000	.1759588	.3546275
lnGiniindex	-3.190994	.2386551	-13.37	0.000	-3.65875	-2.723239
lnschoolenrollmentsecondary	.2651614	.0344213	7.70	0.000	.1976969	.332626
OpenningTrade	.7103041	.082687	8.59	0.000	.5482405	.8723677
Foreigndirectinvestmentneti	-.0131772	.003069	-4.29	0.000	-.0191923	-.007162
Inflationconsumerpricesannu	-.0019129	.0028066	-0.68	0.496	-.0074137	.0035879
_cons	17.9081	.9355584	19.14	0.000	16.07444	19.74176
lnGiniindex						
ControlofCorruptionestimate	.072008	.0190281	3.78	0.000	.0347136	.1093024
lnGDPpercapita	-.1933725	.0190598	-10.15	0.000	-.230729	-.156016
OpenningTrade	.1869797	.0347994	5.37	0.000	.1187742	.2551852
Inflationconsumerpricesannu	-.0016741	.0011932	-1.40	0.161	-.0040128	.0006646
Foreigndirectinvestmentneti	-.0029754	.0012615	-2.36	0.018	-.005448	-.0005029
_cons	5.01942	.1527077	32.87	0.000	4.720118	5.318721
lnPoverty						
ControlofCorruptionestimate	-.4583635	.2215381	-2.07	0.039	-.8925702	-.0241568
lnGDPpercapita	-2.665732	.411888	-6.47	0.000	-3.473017	-1.858446
lnGiniindex	-2.052879	1.500049	-1.37	0.171	-4.992922	.8871637
lnunemployment	.3814906	.1613136	2.36	0.018	.0653218	.6976594
Domesticgeneralgovernmentheal	-.0869026	.0764374	-1.14	0.256	-.2367171	.062912
Populationgrowthannual	-.0478503	.052481	-0.91	0.362	-.1507111	.0550104
_cons	28.68736	8.078847	3.55	0.000	12.85311	44.52161

Source: Stata 15 outputs

**Fig 2.** Estimation Results (government effectiveness)

Three-stage least-squares regression

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
lnGDPpercapita	147	6	.2444926	0.5284	570.26	0.0000
lnGiniindex	147	5	.0654562	0.5788	232.06	0.0000
lnPoverty	147	6	.6685488	0.6861	376.13	0.0000

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
lnGDPpercapita						
GovernmentEffectivenessestima	.3446126	.0439283	7.84	0.000	.2585146	.4307105
lnGiniindex	-3.764882	.2535366	-14.85	0.000	-4.261804	-3.267959
lnschoolenrollmentsecondary	.1647959	.0352824	4.67	0.000	.0956438	.2339481
OpeningTrade	.8020708	.0863766	9.29	0.000	.6327758	.9713659
Foreigndirectinvestmentneti	-.0142035	.0034316	-4.14	0.000	-.0209292	-.0074777
Inflationconsumerpricesannu	-.0004528	.0031948	-0.14	0.887	-.0067145	.0058089
_cons	20.29182	.9866823	20.57	0.000	18.35796	22.22568
lnGiniindex						
GovernmentEffectivenessestima	.0889871	.0133407	6.67	0.000	.0628398	.1151344
lnGDPpercapita	-.2054743	.0166916	-12.31	0.000	-.2381892	-.1727594
OpeningTrade	.1918983	.0303969	6.31	0.000	.1323215	.2514751
Inflationconsumerpricesannu	-.0009522	.0011308	-0.84	0.400	-.0031685	.001264
Foreigndirectinvestmentneti	-.0029391	.0011768	-2.50	0.013	-.0052456	-.0006327
_cons	5.105952	.1308419	39.02	0.000	4.849506	5.362397
lnPoverty						
GovernmentEffectivenessestima	.1357203	.2214987	0.61	0.540	-.2984092	.5698498
lnGDPpercapita	-2.785913	.4486471	-6.21	0.000	-3.665245	-1.906581
lnGiniindex	-2.957133	1.602286	-1.85	0.065	-6.097556	.1832905
lnunemployment	.4867032	.1903378	2.56	0.011	.1136479	.8597584
Domesticgeneralgovernmentheal	-.1759113	.0874688	-2.01	0.044	-.347347	-.0044757
Populationgrowthannual	-.0551052	.0546911	-1.01	0.314	-.1622979	.0520874
_cons	33.06974	8.545738	3.87	0.000	16.3204	49.81908

Source: Stata 15 outputs



**Fig 3.** Estimation Results (political stability and absence of violence/terrorism)

Three-stage least-squares regression

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
lnGDPpercapita	147	6	.2417996	0.5387	608.16	0.0000
lnGiniindex	147	5	.0720469	0.4897	164.52	0.0000
lnPoverty	147	6	.6880019	0.6676	362.42	0.0000

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
lnGDPpercapita						
PoliticalStabilityandAbsence	.097511	.0269382	3.62	0.000	.044713	.1503089
lnGiniindex	-3.356569	.2988319	-11.23	0.000	-3.942269	-2.77087
lnschoolenrollmentsecondary	.3187526	.0353269	9.02	0.000	.2495132	.387992
OpenningTrade	.8938197	.0881365	10.14	0.000	.7210753	1.066564
Foreigndirectinvestmentneti	-.0120068	.0033409	-3.59	0.000	-.0185549	-.0054587
Inflationconsumerpricesannu	-.003733	.0030838	-1.21	0.226	-.0097771	.0023111
_cons	18.1166	1.138411	15.91	0.000	15.88535	20.34784
lnGiniindex						
PoliticalStabilityandAbsence	.0307044	.0091459	3.36	0.001	.0127787	.0486301
lnGDPpercapita	-.1644451	.0185065	-8.89	0.000	-.2007171	-.1281731
OpenningTrade	.2158015	.0329729	6.54	0.000	.1511758	.2804272
Inflationconsumerpricesannu	-.0019107	.0012316	-1.55	0.121	-.0043246	.0005032
Foreigndirectinvestmentneti	-.0024472	.0012321	-1.99	0.047	-.004862	-.0000323
_cons	4.760657	.1411917	33.72	0.000	4.483927	5.037388
lnPoverty						
PoliticalStabilityandAbsence	-.0554216	.1107388	-0.50	0.617	-.2724655	.1616224
lnGDPpercapita	-3.037084	.4035944	-7.53	0.000	-3.828114	-2.246053
lnGiniindex	-3.226134	1.390141	-2.32	0.020	-5.950761	-.501507
lnunemployment	.32293	.1944923	1.66	0.097	-.0582679	.7041279
Domesticgeneralgovernmentheal	-.0984545	.0911558	-1.08	0.280	-.2771166	.0802075
Populationgrowthannual	-.0658362	.0560302	-1.18	0.240	-.1756534	.043981
_cons	36.18562	7.048507	5.13	0.000	22.3708	50.00044

Source: Stata 15 outputs

**Fig 4.** Estimation Results (regulatory quality)

Three-stage least-squares regression

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
lnGDPpercapita	147	6	.1873112	0.7232	833.69	0.0000
lnGiniindex	147	5	.0650754	0.5837	226.68	0.0000
lnPoverty	147	6	.5789265	0.7646	479.82	0.0000

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
lnGDPpercapita						
RegulatoryQualityestimate	.2816099	.0464014	6.07	0.000	.1906648	.3725549
lnGiniindex	-2.777253	.2591327	-10.72	0.000	-3.285144	-2.269362
lnschoolenrollmentsecondary	.3320341	.0361751	9.18	0.000	.2611323	.402936
OpenningTrade	.7016751	.0711691	9.86	0.000	.5621862	.841164
Foreigndirectinvestmentneti	-.0155834	.0032131	-4.85	0.000	-.021881	-.0092858
Inflationconsumerpricesannu	-.0012376	.0026494	-0.47	0.640	-.0064304	.0039552
_cons	16.15757	1.03464	15.62	0.000	14.12971	18.18542
lnGiniindex						
RegulatoryQualityestimate	.10156	.0153691	6.61	0.000	.0714371	.1316829
lnGDPpercapita	-.1905364	.0165654	-11.50	0.000	-.2230041	-.1580688
OpenningTrade	.197238	.0306528	6.43	0.000	.1371596	.2573163
Inflationconsumerpricesannu	-.0013366	.0011515	-1.16	0.246	-.0035935	.0009203
Foreigndirectinvestmentneti	-.0046767	.0012666	-3.69	0.000	-.0071591	-.0021943
_cons	4.998669	.1291912	38.69	0.000	4.745458	5.251879
lnPoverty						
RegulatoryQualityestimate	-.3106351	.2429505	-1.28	0.201	-.7868093	.1655392
lnGDPpercapita	-1.852014	.5144439	-3.60	0.000	-2.860305	-.8437223
lnGiniindex	-.3157839	1.653864	-0.19	0.849	-3.557297	2.92573
lnunemployment	.5615666	.1675	3.35	0.001	.2332727	.8898606
Domesticgeneralgovernmentheal	-.3179701	.0928402	-3.42	0.001	-.4999335	-.1360067
Populationgrowthannual	.0363247	.0646436	0.56	0.574	-.0903745	.163024
_cons	16.06831	9.56743	1.68	0.093	-2.683506	34.82013

Source: Stata 15 outputs

**Fig 5.** Estimation Results (rule of law)

Three-stage least-squares regression						
Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
lnGDPpercapita	147	6	.2039598	0.6718	759.63	0.0000
lnGiniindex	147	5	.0700521	0.5176	178.20	0.0000
lnPoverty	147	6	.6352418	0.7166	419.98	0.0000

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
lnGDPpercapita						
RuleofLawestimate	.1892586	.0328588	5.76	0.000	.1248564	.2536607
lnGiniindex	-2.877027	.2436927	-11.81	0.000	-3.354656	-2.399398
lnschoolenrollmentsecondary	.2719986	.0380885	7.14	0.000	.1973466	.3466506
OpenningTrade	.8135951	.0768385	10.59	0.000	.6629943	.9641958
Foreigndirectinvestmentneti	-.0150093	.0031639	-4.74	0.000	-.0212104	-.0088082
Inflationconsumerpricesannu	.0003961	.0028153	0.14	0.888	-.0051217	.0059139
_cons	16.6466	.9679244	17.20	0.000	14.7495	18.54369
lnGiniindex						
RuleofLawestimate	.0624034	.0132831	4.70	0.000	.0363689	.0884378
lnGDPpercapita	-.2126494	.0191739	-11.09	0.000	-.2502295	-.1750692
OpenningTrade	.2362236	.0320352	7.37	0.000	.1734357	.2990114
Inflationconsumerpricesannu	-.0008284	.0012239	-0.68	0.499	-.0032272	.0015705
Foreigndirectinvestmentneti	-.0039936	.0012732	-3.14	0.002	-.0064889	-.0014983
_cons	5.131603	.1501097	34.19	0.000	4.837394	5.425813
lnPoverty						
RuleofLawestimate	-.209802	.1476764	-1.42	0.155	-.4992425	.0796385
lnGDPpercapita	-2.417709	.4503939	-5.37	0.000	-3.300464	-1.534953
lnGiniindex	-2.147748	1.328466	-1.62	0.106	-4.751494	.4559973
lnunemployment	.3459405	.1748833	1.98	0.048	.0031756	.6887054
Domesticgeneralgovernmentheal	-.1963725	.0834488	-2.35	0.019	-.3599291	-.032816
Populationgrowthannual	-.0236386	.0540351	-0.44	0.662	-.1295455	.0822683
_cons	27.48368	7.70697	3.57	0.000	12.3783	42.58906

Source: Stata 15 outputs



**Fig 6.** Estimation Results (voice and accountability)

Three-stage least-squares regression

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
lnGDPpercapita	147	6	.2501962	0.5061	583.88	0.0000
lnGiniindex	147	5	.0761948	0.4293	125.67	0.0000
lnPoverty	147	6	.6627982	0.6915	400.11	0.0000

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
lnGDPpercapita						
VoiceandAccountabilityestima	.0862136	.0519838	1.66	0.097	-.0156727	.1881
lnGiniindex	-3.330503	.2710749	-12.29	0.000	-3.8618	-2.799206
lnschoolenrollmentsecondary	.3096834	.0350611	8.83	0.000	.2409649	.3784019
OpenningTrade	.8229312	.0903466	9.11	0.000	.645855	1.000007
Foreigndirectinvestmentneti	-.0062808	.0029929	-2.10	0.036	-.0121469	-.0004148
Inflationconsumerpricesannu	-.0093015	.0028118	-3.31	0.001	-.0148125	-.0037905
_cons	18.12304	1.042068	17.39	0.000	16.08063	20.16546
lnGiniindex						
VoiceandAccountabilityestima	.0243376	.0223397	1.09	0.276	-.0194474	.0681227
lnGDPpercapita	-.1690776	.0192094	-8.80	0.000	-.2067274	-.1314279
OpenningTrade	.192953	.0366733	5.26	0.000	.1210747	.2648314
Inflationconsumerpricesannu	-.0036751	.0011502	-3.20	0.001	-.0059295	-.0014208
Foreigndirectinvestmentneti	-.0004398	.0012277	-0.36	0.720	-.0028461	.0019665
_cons	4.814383	.1482801	32.47	0.000	4.523759	5.105007
lnPoverty						
VoiceandAccountabilityestima	-.5053248	.2032922	-2.49	0.013	-.9037702	-.1068795
lnGDPpercapita	-3.02312	.3992115	-7.57	0.000	-3.80556	-2.24068
lnGiniindex	-3.102828	1.352895	-2.29	0.022	-5.754454	-.4512022
lnunemployment	.3959791	.1617518	2.45	0.014	.0789514	.7130067
Domesticgeneralgovernmentheal	-.0770959	.0835918	-0.92	0.356	-.2409328	.0867411
Populationgrowthannual	-.0649531	.054927	-1.18	0.237	-.172608	.0427018
_cons	35.00793	7.326438	4.78	0.000	20.64837	49.36748

Source: Stata 15 outputs