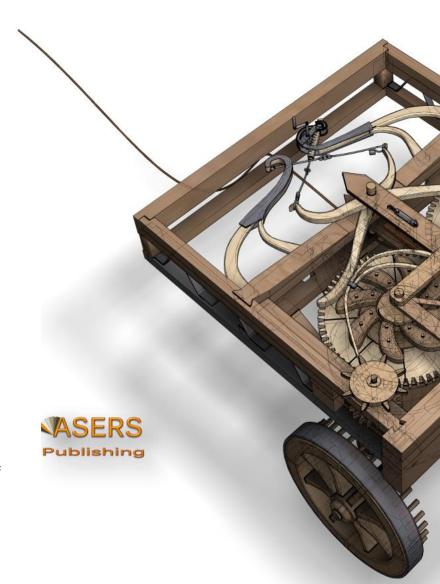
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ESTIMATING THE RELATIONSHIP BETWEEN GOVERNANCE, ECONOMIC GROWTH, INEQUALITY AND POVERTY

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Abstract:

The main purpose of this paper is to estimate the relationship between governance, economic growth, inequality and poverty for 81 countries for the period 2000-2016. We divided the countries into three groups, low-income countries, lower-middle-income countries and upper-middle-income countries. To answer our research question, we use a structural model with simultaneous equations on Panel data. Our results show that the positive or negative impact of governance on the growth-inequality-poverty triangle changes depending on the dimension of governance taken into account and the sample being studied. Given the negative relationship between inequality and growth, democracy should a second time positively affect economic growth through the reduction of inequalities.

Keywords: governance, economic growth, inequality, poverty.

JEL Classification: D73: 043.

Introduction

The empirical literature shows mixed messages about the effects of inequality on poverty reduction. Without considering the effects of inequality on growth, Dollar and Kraay (2002) show that growth is an asset for all social groups, with the elasticity of poverty with respect to growth not being affected by income redistribution. Adams (2004) finds that in developing countries growth reduces poverty only when measured in terms of average income or consumption. Ravallion (2001) nevertheless underlines the moderating effects of inequalities on the poverty reduction capacity of growth. In Africa more particularly, Ali and Thorbecke (2000) find that poverty increases when inequalities are high, since the effects on the distribution of income predominate those of growth on poverty. Fosu (2009) notes that in Africa the elasticity of poverty with respect to decreases with initial inequality. Other recent studies have confirmed that poverty has decreased in Africa, but the rate of poverty reduction remains low compared to other developing countries with similar growth (Sala-i-Martin and Pinkovskiy 2010; Young 2012).

Although theoretical assumptions about the inverse relationship between inequality and economic growth have been empirically verified on several occasions (Bourguignon 2004), the debate on the effects of inequality on growth and poverty is not over. In Barro's (2000) analysis, for example, inequality increases growth in rich countries and reduces it in poor countries. Two fundamental theories relate the important inequalities to the reduction of growth. The first is the theory of the constraining effects of credit (Aghion and Bolton 1997), and the other is the theory of political economy factors, according to which large inequalities can distort policy responses,

reducing the effectiveness of reforms (Alesina and Rodrik 1994; Bardhan, Bowles and Ginitis 2000). Ngepah (2011b) provides an overview of these theoretical approaches.

Most studies on the link between growth, poverty and inequality have three critical limitations. They mainly consider the direct effects on poverty, analyzing growth and inequalities separately; average inequality is often used; and cross-sectional or panel data are used with GDP per capita as a variable for economic growth. Income inequality and economic growth for years has been seen as the major contributor to poverty (Vo et.al 2019; Le Caous and Huarng 2020).

Usually, when the subject of development is open, the concern is whether to prioritize either economic growth or poverty or inequality. Researchers have raised many issues: Is growth enough to reduce poverty? Does Inequality Spread Poverty? What trade-off is between inequality and growth in the fight against poverty?

Following the shortcomings of the classic models of exogenous growth which explain the stability of economic growth in equilibrium, several authors (Romer 1986; Lucas 1988; Barro 1989; Grossman and Helpman 1991; Aghion and Howitt 1998) interested in new models of so-called endogenous growth in order to determine the factors that explain economic growth such as the accumulation of physical and human capital as well as productivity. This generation of growth models has failed to explain how countries have variety in economic growth, productivity and innovation.

Thus, several economists have raised the subject of the quality of institutions and governance. In this regard Alesina and Perotti (1996) integrates political instability, Barro (1996) raises the subject of democracy, Mauro (1995) deals with the subject of corruption, Clague *et al.* (1996) discuss the issue of property rights and (Kaufmann *et al.* 1999; Rodrik 1999) discuss the quality of governance, etc.

This paper studies the relationship between quality governance and the economic growth and poverty triangle. In order to study the effect of the quality of governance on poverty reduction and economic growth, we will build a simultaneous equation model on a sample made up of 81countries grouped according to their income level according to the ranking carried out by the World Bank. The study uses annual data for the period 2000-2016. We opted for this period depending on the availability of data relating to poverty.

Our study differs from previous empirical work by studying a rectangular relationship to test the effect of the quality of governance on the triangle: growth-inequality-poverty. This strategy allows us to identify the direct effect of governance on poverty and its indirect effect through economic growth and inequality on poverty. The introduction of governance indicators plays the role of an exogenous external shock that acts on the triangular relationship linking growth, inequalities and poverty. It is therefore necessary to estimate its effect on poverty by taking into account its simultaneous effect on growth and on inequalities.

2. Literature Review

Empirically, several studies prove that good governance is a stimulus for a country's economic growth. Of course, it is clear that the accumulation of capital and technical progress are not the only factors, which determine the progress in development between countries. The recent literature on the determinants of growth clearly highlights the role of the quality of governance as a catalyst for growth. Likewise, studies that address the relationship between the quality of governance and income inequality often show a negative and significant link between the two.

Thus, Mauro (1996) studied the relationship between governance and economic growth. He concluded that the effect of corruption on growth is small. He also showed that the causality between corruption and investment is as negative as it is strong. Gyimah and Brempong (1999) show that corruption discourages the incentive to invest and therefore harms economic growth. Likewise, Mo's study (2001) also confirms that corruption is detrimental to economic growth and causes political instability. Aidt et al. (2005), use the threshold effect method of Caner and Hansen (2004) to study the relationship between corruption and economic growth. They prove that corruption has a negative and significant impact on economic growth in countries characterized by good governance. While for countries with poor governance, the effect of corruption on growth is low to zero. Li et al. (2000) discuss the link between economic growth, income redistribution and the level of corruption. They use a sample that covers 47 countries during the period 1980-1992. Their empirical results show that corruption has a negative impact on growth, but corruption alone explains little of the growth differences. Dollar and Kraay (2000) have shown that economic growth can reduce poverty in the least developed countries and that poor quality of governance determined by corruption and political instability can worsen poverty. Glaeser et al. (2004) show that poor countries are likely to overcome poverty through good policies Easterly (2002, 2007) studies the relationship between the level of income inequality and the quality of governance. He takes the indicators of Kaufmann and Kraay (2002) as a measure of governance. As for the measures of inequalities, he uses the

WIDER database (2000). The author finds a negative relationship between the level of income inequality and the quality of governance. Gymah-Brempong *et al.* (2006) analyze the effect of corruption on economic growth and income distribution using a panel of 61 countries at different stages of economic development over a 20-year period. Using two measures of corruption, they find that the impact of corruption on per capita income is statistically significant by region. They find that African countries are the most damaged by the effect of corruption on growth. Anyanwu (2013) seeks to study well the different factors that determine poverty as the policy changes that are able to reduce the incidence of poverty in Africa and foster inclusive growth. He asserts that socioeconomic strategies and policies that are conducive to the existence of inclusive growth help to facilitate the process of poverty reduction in Africa. Henri (2013), confirms that the quality of economic regulation and political stability positively affect economic growth. Ahou (2015) studies the link between governance indicators and economic growth. It concludes that some governance variables. Akobeng. E (2016) studies the effect of GDP per capita and sectoral growth on poverty. It checks that institutions can strengthen the growth-poverty link. The study of Achim (2017), shows that corruption significantly reduces, being a major obstacle for economic growth. Following to Bot *et al.* (2018), which investigate the influence of corruption and shadow economy upon the economic development.

Nguyen *et al.* (2020) analyzed the concurrent relationship between government quality, economic growth and income inequality within Vietnam in the period 2006–2017 with Stata tool with 3-stage regression model. The results show that higher government quality will boost economic growth and reduce inequality among provinces.

Egla et al. (2020) analyze the factors that impact poverty and compare these results between countries within the European Union and post-communist countries that include the Western Balkan (WB) countries: Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia. The method used consists of both descriptive statistics and multiple regression analysis using the fixed effect model where poverty is taken as the dependent variable. The results show that income inequality does indeed impact the further progress of poverty for both the EU and WB, while economic development in terms of GDP is shown to have a more significant impact on EU than in WB, where the most significant impact was through income per capita.

Yogeeswari *et al.* (2021) study the impact of microfinance on poverty and income inequality in developing countries, utilising the experiences of 34 developing countries for the period 2009 to 2016, the role of microfinance on poverty in these countries is examined. The results imply that the degree to which the existing forms of microfinance effectively reduce extreme poverty is less workable in developing countries, particularly when the hardcore poor are likely being deprived of receiving access to microfinance.

3. Methodology

To study the simultaneous interaction between economic growth and inequality and to add a third equation that measures poverty, we use a structural simultaneous equation model. This approach allows us to distinguish the direct and indirect effects of governance indicators on poverty through economic growth and inequality.

We build a model that has three equations. The first explains the economic growth Barro (2001). As for the second, it explains inequalities (Deininger and Squire 1998; Forbes 2000 and Squire 2003). Finally, the third explains poverty (Ravaillon 1997; Dollar and Kraay 2000). These three equations are estimated in order to introduce the different relationships between the endogenous variables where the governance variables are considered to be exogenous. The aim of our empirical study is to identify the factors that determine poverty while taking into account the simultaneous effect of economic growth on inequality.

The functional form of our structural model with simultaneous equations is written as:

$$\begin{cases} GRGDPP_{it} = \alpha_0 + \alpha_1GINI_{it} + \alpha_2GOV_{it} + \alpha_3A_{it} + \mu_{it} & 3.1\\ GINI_{it} = \beta_0 + \beta_1GRGDPP_{it} + \beta_2GOV_{it} + \beta_3B_{it} + \vartheta_{it} & 3.2\\ IPOV_{it} = \gamma_0 + \gamma_1GRGDPP_{it} + \gamma_2GOV_{it} + \gamma_3GOV_{it} + \gamma_4C_{it} + \varepsilon_{it} & 3.3 \end{cases}$$
 With i = 1,,81 ; T = 2000......2016

 $GRGDPP_{it}$, $IPOV_{it}$, $GINI_{it}$ and GOV_{it} Represent respectively the growth rate of GDP per capita, the incidence of poverty, the Gini index and the governance indicators.

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

 μ_{it} , ϑ_{it} and ε_{it} : represent the error terms.

The ratio of the number of poor to the total population of a country or the incidence of poverty corresponds to the absolute approach to poverty where the threshold is set according to the basic needs of the local population. In our study, we relied on the definition of income poverty, which is based on the situation of individuals who are unable to meet their basic needs essential to their survival. This design has been widely used in the work of the

World Bank. Indeed, anyone with an income below an absolute threshold (\$ 1.2 or \$ 1.9 per day ...) is considered poor.

The GINI index is a frequently used criterion to measure income inequality within a population. This variable is used to detect the effect of income distribution on poverty and economic growth. Governance indicators are introduced into the growth equation based on the work of Kaufman D. Kraay A. and Mastruzzi M. (2003), according to which the quality of governance is an important factor for the economic growth of a country.

Solving the simultaneous equation model requires verification of the model identification condition, Bourbonnais (2002). Indeed, this condition is determined equation by equation in order to avoid that the results are biased. The application of the identification conditions shows that all the equations in the model are overidentified. In our study, we will only use the triple least squares method (3SLS). The triple least squares method takes into account endogeneity problems. Greene (2005) shows that, among all the estimators of instrumental variables, the triple least squares estimator is asymptotically efficient. The triple least squares method (3SLS) starts by estimating each equation by the double least squares (or the instrumental variables), then uses the residuals of this first step to estimate the relationship between the residuals of the different equations and finally uses the least squares generalized (GCM) to globally estimate the whole model taking this information into account. The choice of the triple least squares method for the estimation of our model is justified by the fact that it uses all the information available on the variables and offers efficient estimators.

4. Results and Discussion

Let us first recall that the econometric procedures implemented aim to study the relationship between governance, economic growth and poverty. To do this, a model of simultaneous systems of equations was estimated. We are going to make estimates by groups of countries while introducing dummy variables (dummy-1, 2 and 3), and on which we perform the same regressions. This will allow us to check whether the variables have the same effects in the different groups, namely low-income countries, lower middle-income countries and upper middle-income countries.

The correlation matrix analysis shows that there is a strong correlation between the governance indicators themselves, that is why we will introduce them one by one.

4.1 Estimation Results for Low-Income Countries

The estimation results of the growth equation for low-income countries; it mainly illustrates the effects of income inequality and the quality of governance on economic growth.

First, the effect of inequality on the GDPP growth rate is negative and statistically significant at 1%. This result is consistent with the work of Alesina and Rodrik (1994), Clarke (1995), Fishlow (1995) who find a negative link between the GDPP growth rate and the GINI index. Then, the analysis of the results shows that governance variables such as citizen voice (CV), political stability (PS), government efficiency (GE), regulatory quality (RQ) positively affect economy growth in low-income countries. These results correspond to empirical results, which demonstrate that improving the quality of governance is an essential factor for economic growth. This positive relationship between these governance indicators and the GDPP growth rate confirms the work of Kaufman *et al.* (2003).

Indeed, economic growth improves through the participation of civil society in political life and the contribution to civil and human rights. Likewise, many low-income countries have poorly exploited and sometimes-unexploited natural resources, the existence of an effective government (good management of state expenditure and revenue, better quality of services provided by the government public administration and highly qualified state personnel) is able to stimulate economic growth. In addition, political stability is essential for economic growth. Several empirical studies claim that political stability positively affects economic growth either directly (Barro and Sala -i – Martin, 1997) or indirectly through the investment channel (Alesina and Perotti 1996 and Svensson 1998).

In contrast, the corruption control variable (CC) negatively affects economic growth. This finding contrasts with empirical studies that show that corruption harms economic growth either directly or indirectly (eg, the investment channel). The unexpected sign of the corruption control indicator does not justify that corruption is good for economic growth. However, it is likely that a new approach to fighting corruption, tailored to poor countries, would be more adequate. The latter suffer from the existence of a failing market, excessive bureaucracy and asymmetry of information. Indeed, in countries characterized by high transaction costs, recourse to corruption may be justified to facilitate transactions.

For the control variables, we notice the statistical significance of trade openness which positively affects the growth rate of GDP per capita. It is the same for the population growth rate which has a positive impact on the growth rate of GDP per capita. With regard to education, its effect is statistically insignificant although it positively affects economic growth.

This equation shows two effects, namely the effects of governance indicators and those of the GDPP growth rate on inequality. The relationship between growth and inequality is verified in two ways. The first relationship analyzes the effect of the GDPP growth rate on inequality.

The second tests the quadratic effect by introducing the logarithm of GDPP and its square (Log (GDP) and Log (GDP) ²). Lundberg and Squire (2003) to test the link between inequality and growth have also used this method. Analysis of the results shows the negative link between the GDPP growth rate and the GINI index. Regarding the Kuznets hypothesis, the results show that the quadratic relationship between the logarithm of the GDPP and the GINI index is confirmed. Several empirical studies confirm this finding. Indeed, Mbabazi *et al.* (2002) study the impact of economic growth on inequality using a dummy variable that indicates countries in Sub-Saharan Africa. They find that growth reduces inequalities by a coefficient equal to 0.8.

The estimation results of the third poverty equation show that the effect of the GDPP growth rate on the incidence of poverty is negative and statistically significant. Economic growth is therefore a major factor in reducing poverty in low-income countries. This result is consistent with previous empirical studies on the major role of economic growth in poverty reduction (Deininger and Squire 1996; Dollar and Kraay 2002; Meng *et al.* 2005).

The relationship between inequality and the incidence of poverty is statistically insignificant even though the link between them is positive, suggesting that reducing inequalities may reduce poverty.

Furthermore, the analysis of the results shows that none of the governance variables is significant and that the signs vary from one indicator to another. It therefore appears that the quality of governance has no direct effect on poverty reduction in low-income countries during the study period. However, this result can be justified by the fact that our measure of poverty concerns only the monetary approach to poverty. Based on the capabilities approach adopted by Sen, it turns out that theoretically there is a direct relationship between poverty and the quality of governance.

4.2 Estimate Results for Lower Middle-Income Countries

The results estimation of growth equation for lower-middle-income countries show two main relationships, namely the effect of income inequality and the quality of governance on economic growth.

First, the effect of inequalities on the GDPP growth rate is negative and statistically significant at 1%. These results are consistent with some empirical work that believes that reducing inequalities is favorable to economic growth. For governance indicators, we note that only three indicators have a positive and significant effect of 5% on the GDPP growth rate, which confirms the work of Kaufman et al (2003). Indeed, the two indicators: citizen voice and political stability and absence of violence, which represent political governance, constitute a favorable climate for growth. Likewise, corruption control stipulates the factors of production, creates an economic environment beneficial to productivity, and therefore stimulates economic growth.

The estimation results for this equation reveal the effects of the GDPP growth rate and the quality of governance on inequalities. The effect of the GDPP growth rate on the GINI index is negative and statistically significant. As for the Kuznets hypothesis, the quadratic effect (Log (GDP) and Log (GDP) ²) is statistically insignificant.

In addition, the inclusion of governance variables in the inequality equation gives rise to a negative and statistically significant relationship between inequality and four governance indicators namely political instability, government effectiveness, state law and control of corruption. Indeed, the quality of governance is necessary for a better distribution of income.

Analysis of the empirical results relating to the third equation shows that the effect of the GDPH growth rate on the incidence of poverty is negative and statistically insignificant. On the other hand, the relationship between inequality and the incidence of poverty is statistically insignificant even if the link between them is positive, which suggests that a reduction in inequalities is able to reduce poverty.

Analysis of the results shows that certain governance variables negatively affect the incidence of poverty in lower middle-income countries. Indeed, government effectiveness (GE), rule of law (RL) and regulatory quality (RQ) are of paramount importance for economic growth. Thus, protecting property rights and reducing transaction costs through the rule of law can reduce poverty. This idea is confirmed by other studies (Acemoglu *et al.* 2001; Kaufmann *et al.* 2002) which establish a relationship between the rule of law and economic growth. Likewise,

improving the quality of regulations is useful in ensuring the harmonization and proper functioning of the market economy in order to stimulate economic growth, which contributes, in the long term, to poverty reduction.

4.3 Estimation Results for Upper-Middle-Income Countries

The estimation results for upper-middle-income countries mainly show the effects of income inequality and the quality of governance on economic growth.

First, the effect of inequalities on the GDPH growth rate is negative and statistically significant at 1%. This negative and significant effect corroborates theoretical studies, which have shown that inequality can negatively affect the growth rate of PIBH (Alesina and Rodrik 1994; Forbes 2000). For governance indicators, only three governance indicators are statistically significant. Indeed, the citizen voice (VA) variable and government efficiency (GE) affect economic growth positively. On the other hand, corruption control affects economic growth negatively. This result may be explained by the fact that corruption does not affect economic growth negatively in the early stages of development provided an effective government controls it. Thus, some studies Méon and Sekkat (2005) are of the opinion that corruption can be justified because it allows evading regulations and ineffective institutions. Then, corruption would be able to develop economic growth since it decreases the administrative obstacles and the transaction costs of companies which seek to face excessive regulations Transparency international (2014).

For the control variables, we note that trade openness is positively correlated with the GDPH growth rate with a significance of 1%. Indeed, various empirical studies demonstrate the beneficial effect of trade openness on economic growth (Yanikkaya 2002; Caupin and Saadi 2003; Gries and Redlin 2012). Likewise, we note the statistical significance of the variable credit granted to the private sector (CPS) which positively affects the GDPP growth rate.

Through the analysis of the results, we notice that, for upper-middle-income countries, increasing income inequality reduces the growth rate of GDP per capita. The Kuznets hypothesis is also confirmed, thus the logarithm of GDPP and its square (Log (GDP) and Log (GDP) ²) are statistically significant. Indeed, the coefficient of Log (GDP) is positive while the sign of the coefficient of Log (GDP) ² is negative. This result shows that the inverted "U" shape of Kuznets which explains the long-run relationship between average income and inequality holds

The negative impact of inequality on growth has been confirmed by several empirical studies. Brueckner and Lederman (2015) empirically show that income inequality hurts economic growth in advanced economies. They also show that, in high- and middle-income countries, increasing income inequality reduces human capital. The results also show that the effect of governance indicators on inequality is negative and statistically significant. Political governance such as political stability (PS) and citizen voice (CV) affect inequality negatively. The quality of governance in upper-middle-income countries determines the level of inequality.

The analysis of the results of the third equation of the model, which concerns poverty, shows that the effect of the GDPP growth rate and that of inequalities on the incidence of poverty is statistically insignificant. Regarding governance indicators, the results of the estimates of this equation show that:

The Citizen Voice (CV) and Political Stability (PS) indicators, which represent the political dimension of governance, affect the incidence of poverty negatively and are statistically significant.

On the one hand, civil rights, political responsibility and freedom of information consolidate the political voice and participation of the poorest social class. Effectively, the poor find favorable ground for their political demands so government can effectively respond to the demands of the poor Sen (2000).

On the other hand, insecurity and violence slow down the pace of growth by destroying a country's economic potential. Thus, certain social layers of the population slide into poverty and the poor themselves see their situation worsen Collier (2007).

On the other hand, when it comes to the rule of law (RL), we note that it has a positive and statistically significant impact on the incidence of poverty. The reasons why the rule of law might be a negative factor in poverty reduction are unknown.

Indeed, strict law enforcement may prevent the poor from having a livelihood, especially those that are sometimes prohibited by public authorities. Finally, the fight against corruption, respect for the law and the protection of property rights enable the poor to access opportunities and escape poverty Gupta *et al.* (2002).

Conclusion

The application of the simultaneous equation model, which deals with the relationship between governance, economic growth, inequality and poverty, shows that this link seems more complex given the

existence of the cross and multiple causalities that link the growth-inequality-poverty triangle. The latter remains a subject of controversy to this day. Our results show that the positive or negative impact of governance on the growth-inequality-poverty triangle changes depending on the dimension of governance taken into account and the sample being studied. For this reason, we find that some governance indicators appear more significant than others do. It is crucial to see how good governance directly affects poverty especially in the countries that suffer from it the most as the international community implements various poverty reduction programs in these countries.

Regarding the direct link that links the quality of governance to poverty, our results show that no statistically significant correlation could be detected between any of the six governance indicators and the incidence of poverty in low-income countries. The other two groups revealed a statistically significant relationship between certain governance indicators and the incidence of poverty. These results suggest that international development institutions must take into account the stage of development of a given country before stipulating good governance as a necessary condition that serves to reduce poverty directly.

Thus, the direct link between good governance and poverty reduction which has been adopted by international institutions in order to achieve the millennial development goals set in 2015, seems to have a weak empirical basis for low-income countries whose more 50% of the population suffer from poverty. This shows that, for these countries, the most effective means of reducing poverty would be through accelerating the pace of growth and reducing inequalities through better redistribution of wealth. Indeed, our results show that the growth rate of GDP per capita negatively affects the incidence of poverty at the same time inequality has a cause and effect relationship with growth. On the other hand, for the two other groups, this direct link can exist. Indeed, poverty can be reduced by improving the quality of governance. Our empirical results show that for lower middle-income countries, there is a negative and significant relationship between the incidence of poverty and indicators of economic governance; whereas, for upper middle-income countries, this link concerns political and administrative governance. Indeed, at a certain level of development, the nature of the political regime plays an essential role in poverty reduction.

In addition, our study has shown that governance indicators have a dual effect on the one hand on growth and on the other hand on inequalities for the three groups studied. This binary link can take the opposite direction as it moves from one level of development to another.

Our estimation results suggest that the positive impact of good governance on growth can be mitigated in the presence of strong inequalities that hamper efforts to reduce poverty through economic growth.

Likewise, the results obtained lead us to believe that it is possible that threshold effects and multiple equilibrium exist. The most concrete example is the effect of corruption control on economic growth, which is negative for low-income countries. This same effect becomes positive for lower middle-income countries and then becomes negative again for upper middle-income countries. Certain governance indicators are sometimes interdependent. For example, the positive effect of democracy depends on political stability, and controlling corruption also requires the existence of an effective government and so on.

In addition, in the case of upper middle-income countries, we notice the existence of a triple effect for the citizen voice indicator. First, this indicator is positively related to economic growth, second, it has a negative and significant effect on inequality and finally it negatively affects the incidence of poverty. This sequence confirms the idea that democracy is an essential factor for economic growth. It is able to reduce inequalities since it promotes an egalitarian position. Therefore, it allows the poorest class of society to access decision-making, which leads to a better redistribution of income. Given the negative relationship between inequality and growth, democracy should a second time positively affect economic growth through the reduction of inequalities.

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