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RESEARCH ARTICLE

Institutional Quality and Poverty Reduction in MENA: The Interplay of Growth, Corruption, and Inequality

Zahia HAMDENE [1], Mohamed NEFFATI [2]

[1]Department of Economics, College of Business, King Khaled University, Abha, SAUDI ARABIA
[2] Department of Economics, College of Business, Al Imam Mohammad Ibn Saud Islamic University (IMSIU), Riyadh, Saudi Arabia & High Business School, LAMEF, Sfax University Tunisia

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***Corresponding Author:**

ibelachheb@ub.edu.sa

ABSTRACT

The impact of economic growth and corruption on poverty continues to be a controversial subject and studies on these topics remains fruitful. The global financial crisis and the social impact of COVID19 pandemic have revive the debate on this subject. Thus, the purpose of this study is to contribute to this discussion by examining the linkages between growth, corruption, and poverty for a sample of seven MENA countries over 2003-2021. First, we develop a theoretical nexus on the link between growth and poverty and corruption and poverty. Second, at the empirical level, as poverty is a multidimensional problem, we, primarily, calculate a multidimensional poverty index (MPI) for each country in the sample. Secondly, we conduct a descriptive analysis of the states of corruption, growth, and poverty in these countries. Finally, Pooled EGLS estimation methods were used to study the impact of growth, inequality, and corruption on MPI. The empirical results assert that, in MENA countries, growth is pro-poor and corruption has a positive and largely significant impact on poverty, as it reduces the rate of poverty alleviation.

INTRODUCTION

The debate on the fight against poverty remains a controversial issue that interest economists and politicians. In fact, since the famous work of Dollar and Kraay (2000): "growth is good for the poor", numerous studies have explored the complex interactions between economic growth, income inequality, and poverty. Two theses are noteworthy. The first supports this approach and shows that in all circumstances, growth benefits to poor [Ravallion, (2004), Klasen (2007), Dollar and al., (2016)]. The second, however, adopts an approach whereby "the Growth is not enough for poverty reduction; it is a necessary condition, but it must be accompanied by the implementation of policies to reduce present and future inequalities [Bourguignon (2003), Vandemoortele and Delamonica (2022)]. Recently, studies of the social impacts of COVID 19 pandemic revive debates on these topics. Nevertheless, we must note that many economists admit that the failure of growth to reach poor is largely due to the poor quality of institutions, specifically due to corruption.

Although researches studying the influence of institutions' quality on poverty are not abundant, its allow us to distinguish two prominent theses. The first, is supported, among others, by D'Agostino and al.(2016), Mauro, (1995) and Mo (2001). It argues that institutions' quality is essential for accelerating the rhythm of economic growth and alleviating poverty and that corruption reduces economic growth. The second thesis, however, argues that corruption stimulates economic growth

and that the « brebis » can play a positive role in promoting business development [Acemoglu and Verdier (1998), Leff and Heidenheimer (2002), Liu (1985)].

As a result, economic growth, inequality, and corruption play a crucial role in determining the level of societal well-being. The inexistence of consensus on the relationship between economic growth and poverty, on one hand, and between corruption and poverty, on the other hand, has encouraged us to contribute to this debate. As poverty is now known as a multidimensional phenomenon and since researchers studying the link between growth and poverty concentrate largely on monetary poverty measures, we seek to investigate the nexus between growth, corruption, and multidimensional poverty. This study addresses two questions: Does growth contribute to alleviate multidimensional poverty in MENA countries? Does corruption affect poverty?

In response to these questions, our paper is structured as follows: The first section is the literature review. The second level is empirical. It is divided into three parts: First, we calculate a multidimensional poverty index (MPI) for the seven countries in our sample for the period 2003–2021. Next, we carried out a descriptive analysis of the corruption in these nations. Finally, we study empirically the nexus between growth, corruption, and multidimensional poverty (MPI), and we report and discuss the results.

2. LITERATURE REVIEW

2.1. Link between growth and poverty

The economic literature has well established the link between growth and poverty. It dates back to the 1960s and remains an alarming subject nowadays; studies on the social impact of COVID-19 have piqued interest.

The 1950s and 1960s , are known by the development of the «trickle-down» thesis, a widespread opinion at this time. This thesis, while it did not explicitly mention the link between growth and poverty, is largely supported by the works of the World Bank and by classical economist. In fact, the World Bank state that the benefits of growth would eventually be widely distributed to the masses in the form of jobs or other economic opportunities while classical development models, especially those of Lewis (1954) and Fei and Ranis (1961), suggests that sustained growth in the industrial sector would undoubtedly lead to a distribution of its profits through a vertical and horizontal diffusion of wealth and, therefore, growth benefit to poor.

The debate on the link between growth and poverty has been revived and comes to the fore following the contribution of Dollar and Kraay (2000) in their famous article “Growth is Good for the Poor”. Dollar and Kraay (2000) estimated that the elasticity of poverty to growth is, on average, equal to one, and that growth is pro-poor. This finding triggered the debates on this subject and, even though several theoretical and empirical studies have examined pro-poor growth, it remains a controversial topic (Ravallion, 2004; Klasen, 2007). The first question is about the meaning of this term itself. Does pro-poor growth mean that growth reduces poverty or that growth benefits to poor, relatively more? Given the heterogeneity of poor people, should the same weight be given to people close to the poverty line and people further away from the poverty line?

The clash between studies in this topic helps us raise two major approaches. The first maintains that, in all circumstances, growth is good for the poor. It is further supported by Dollar and al. (2016), who stated that "growth is still good for the poor". Similarly, Bhalla (2002), and Sala-I-Martin (2006) argued that “growth is enough to reduce poverty.”. Cling and al., (2004) attested that the elasticity of poverty to growth is above one on average and economic growth is historically "pro-poor". These scholars considered that the World Bank’s statistics are overly pessimistic and that poverty has, in fact, sharply reduced in the world, without any need for targeted policies. The second, however, emphasize that the level of inequality has a strong impact on the evolution of poverty. So, although growth is a necessary condition, but, alone, is insufficient for poverty reduction. It must be accompanied by an equitable redistribution of resources. In fact, Bourguignon (2003), Cling and al., (2004) and others, highlighted that growth increases inequality and does not benefit to poor. They

defended that "growth alone is not enough for poverty reduction; it must be accompanied by the implementation of policies to reduce current and future inequalities.". In the same line of thinking, Vandemoortele and Delamonica (2022) showed that there is no strict one-to-one relationship between poverty reduction and growth of income among the poor at the national level……In sum, the proponents of this approach devote their attention, among other factors, to the notion that inequality can influence the rate of poverty reduction.

Two main reasons justify the importance of inequality in poverty reduction policies. First, the impact of growth on poverty varies with the degree of inequality. Indeed, a low level of inequality is conducive to poverty reduction since that an increase in national income leads to a greater volume of real resources for low-income groups. Additionally, a decline in inequality is a positive factor that increase the share of income of the poor (Maxwell, (2001)]. Second, high inequality is bad for growth; a high rate of inequality can reduce the rate of poverty reduction by puncturing global economic growth. In short, growth, income inequality, and poverty are inseparable and sometimes considered the three sides of the same triangle. The higher the income inequality is, the weaker the repercussions of a certain rate of growth on poverty reduction are. Thus, as many researchers have shown, there is a consensus that it is very important to account for the changes in inequality over time to study the poverty-growth elasticity [Bourguignon (2003); Adams, (2004); Zaman and al.,(2020); Crespo, and al., (2022)].

Recently, research on this subject has come back to the forefront. The devastating economic and social impact of the COVID-19 pandemic has engendered renewed interest in investigating the relationship between poverty, inequality, and economic growth (Bruckmeier and al., 2021; World Bank, 2020). We should note, however, that as poverty is recognized as a multidimensional problem, work on the link between growth and multidimensional poverty is beginning to gain "a spotlight"

Very often, a higher income inequality provokes political and social instability, thus hindering growth. Therefore, in any study on poverty, it is essential to analyze the interaction between growth, poverty, and inequality to assess the scope of economic policy. However, despite the implementation of several poverty alleviation programs in many countries, inequality persists. Poverty persists not only because of the lack of means but also because of the failure of institutions, especially due to a higher rate of corruption. In the following subsection, we focus on corruption, growth, and poverty interactions.

2.2. Corruption and poverty

The fundamental factor that justifies differences in prosperity between countries is the quality of their institutions. Several studies have shown the existence of a strong link between institutional quality and poverty and increasing attention has been devoted to demonstrate how policies and institutions affect the distribution of economic resources, and how this ultimately induce poverty (Brady and Sosnaud, 2010; Brady and al., 2016). Scholars, such as Dollar and Kraay (2000) and Tebaldi and Mohan (2010), have recognized that growth can reduce poverty when backed by institutional policies. The indirect effect of institutions is mainly manifested through the channel of economic growth; poor-quality institutions hinder growth and, therefore, reduce the rate of poverty alleviation, and vice versa. D'Agostino and al. (2016), treating corruption as an endogenous variable, estimated its impact on growth. They distinguish two governance regimes: in a regime with high-quality political institutions, corruption has a substantial negative impact on growth, whereas in a regime with low quality institutions, corruption has no impact on growth. Singh (2021), using six institutional measures of governance conditions (government effectiveness, political stability and absence of violence, control of corruption, voice and accountability, regulatory quality, and rule of law), explained how poverty rate could be accelerated by deep-rooted poor institutional quality. Thus, it is widely understood that the variation in poverty across countries is due to the quality of institutions, particularly the degree of corruption.

Corruption, one of the most prevalent problems that seems to affect all countries, is defined as the abuse of public power for private gain. It is a major challenge to sustainable economic growth and a

destructive phenomenon that affects economies, causes poverty, and reduces its rate of alleviation, especially through the path of economic growth. Since the pivotal work of Mauro (1995), the link between corruption and economic growth has become a debated subject. Several studies, theoretical as well as empirical, have been undertaken to examine the effects of corruption [Marakbi, (2020); Asteriou and al., (2021); Henri and al.,(2023)], and the clash between these works allows us to distinguish among three theses.

The first supports that corruption, a symptom of institutional failure, is often considered the principal cause of the attenuation of the rhythm of poverty reduction (Njangan and al., 2023). It cuts down growth and, therefore, reduces the rhythm of poverty alleviation [D'Agostino and al., (2016), Mauro, (1995)]. Hodge and al. (2011) modeled the transmission channels through which corruption indirectly affects growth; corruption hinders growth through its adverse effects on investments, human capital, and political instability. Gupta and al. (2002) argued that corruption leads to increase inequality and poverty and discussed several channels through which corruption may affect income inequality and poverty. Corruption causes several problems, such as a decline in economic growth, aggressive taxes, less effective social programs, poor access to education, lower social spending, and increased investment risks. Thus, poverty is negatively correlated with various governance and corruption control indices and we can affirm that the more corrupt countries are, the more poverty persists, and that anti-corruption strategies reduce income inequality and poverty . Anisah (2019) examines how corruption affected Indonesian provinces' economic growth between 2004 and 2015. The results of their study reveal that the impact of corruption indicates a deteriorating effect on growth in provinces with corruption levels below the threshold, and the destructive effect of corruption appears to be stronger in governorates with corruption levels above the threshold.

The second thesis, in contrast, defends the presence of corruption and attests that it is a support of economic development. Leff and Heidenheimer (2002) and Liu (1985) showed that "bribes" play a positive role in promoting business development. Narasaiah (2005) argues that corruption does not impede development, but rather, it can accelerate it by circumventing bureaucratic red tape. Meon and Weill (2010) and Anisah (2019), among others, affirm that corruption stimulates foreign direct investment and, therefore, promotes economic growth. Even more, Huang (2016) studied the connected relationship between corruption and economic development in 13 Asia-Pacific countries and found that, despite high corruption levels, South Korea and China are experiencing economic advancement. D'Agostino and al. (2016) find that corruption in investment expenditures is likely to enhance economic growth.

The third thesis, however, demonstrates that corruption's effect on growth is conditional; it depends on many factors. Aidt and al. (2008) show that the effect of corruption depends on the quality of institutions: in a regime with high-quality political institutions, corruption has a substantial negative impact on growth; nevertheless, its effect is positive under inefficient governance. Ali (2015) attested that there are three phases of corruption: pre-modern, modern, and post-modern and that causes and effects of corruption differ across stages, as do the actions aimed at reducing it. Davina and al.(2024) introduce a new notion; the social network. They suggest that the effect of corruption depends on the social individual's network. Thus, only citizens that face multiple deprivations are able to use their social networks to ease access to public services without fronting difficulties. Therefore, corruption is helpful and there is a positive relation between poverty and corruption

In summary, regardless of the nature of relationship between corruption and growth and corruption and poverty, it is crucial to study the effect of corruption in any poverty analysis.

3. Growth, multidimensional poverty and corruption in MENA countries

This section examines the effects of inequality, growth, and corruption on a multidimensional measure of poverty. Few studies are interested about the relationship between economic growth and multidimensional poverty. So, this question deserves to be studied for at least three main reasons. First, the multidimensionality of poverty is widely acknowledged and declared by both theoretical and empirical studies [World Bank, 2000/2001; Burchi and al., (2021); Burchi and al.,

(2022)]. Second, it combines between two different Sustainable Development Goals (SDGs) of the 2030 Agenda: Goal 1, "end poverty in all its forms everywhere," and Goal 8, "promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work "(Balasubramanian, and al., (2023)). Third, to the best of our knowledge, the works on this topic are very scarce, and most of them are limited to describe the trends in GDP and multidimensional poverty at the country level. There is very little empirical study on this relationship. In fact, Santos and al. (2019) evaluated the relationship between economic growth and multidimensional poverty using an unbalanced panel of 78 countries from 1999 to 2014. They discovered that growth had a negative impact on the Multidimensional Poverty Index (MPI) using a first-difference estimator. Burchi and al. (2022) use the Global M0 (G-M0) and the Global Correlation Sensitive Poverty Index (G-CSPI) to measure the impact of growth on multidimensional poverty in low- and middle-income nations. Balasubramanian and al. (2023) use an unbalanced panel dataset of 91 low- and middle-income nations recorded between 1990 and 2018. They use the first difference estimator to calculate multidimensional poverty's growth elasticity. Their findings demonstrate the importance of economic expansion as a tool for reducing multifaceted poverty.

Our study contributes to this less-explored question by examining the effect of growth and corruption on multidimensional poverty in MENA countries. So that, First, we calculate a multidimensional poverty index (MPI) for the seven countries in our sample over the period 2003-2021 by introducing the same dimensions used to calculate MPI on the World Bank reports: health, education, and standard of living, dimensions closely related to the Millennium Development Goals ,we offer a descriptive analysis of the state of corruption and analyze graphically the link between poverty, corruption, and growth. Second, we conduct an empirical validation to study the incidence of corruption, economic growth, and inequality on MPI using panel data estimation.

3.1. Statistics analysis of the state of poverty and corruption

3.1.1 Construction of MPI :

Poverty is a multifaceted issue; its causes are no longer limited to a deficiency of income, as preconize the monetary approach. Since 2010, the United Nations Development Program and international organizations have recognized poverty as a multidimensional problem. This recognition is reflected in the establishment of a new measure of poverty: multidimensional poverty index(MPI), which replaces the human poverty index (HPI) that started appearing in human development report's from 1997 onwards. This recognition attests the importance, usefulness, and rigor of this index as a new measure of well-being. However, data on the MPI for our sample countries are scarce. Only few observations are available and reference years differ considerably.

For this reason, we calculated an MPI for the seven countries in our sample for the period 2003-2021. We introduced the same dimensions used for calculating MPI's World Bank: health, education, and standard of living. These three dimensions were equally weighted (1/3 weight was assigned to each dimension). We further supported the relevance and robustness of our index by using indicators closely linked to the Millennium Development Goals (MDGs): nutrition (MDG 1), schooling (MDG 2), infant mortality (MDG 4), and access to clean water and sanitation (MDG 7). The dimensions used, corresponding indicators, and associated weights are summarized in Table 1 below.

TABLE 1: Dimension and sub-indices of the MPI

Dimension of the MPI	Sub-indices of the MPI	All indicators computed MPI	Indicator used to calculate the MPI	Weight
Health	**Infant mortality**	A child died in the family.	Mortality rate, under 5 (per 1,000 live births)	$\frac{1}{6}$
	Nutrition	An adult or child in the family is malnourished.	Prevalence of underweight, weight for age (% of children under 5)	$\frac{1}{6}$

Education	**Year of schooling**	None of the household members has at least five years of full schooling.	Primary completion rate, total (% of relevant age group)	$\frac{1}{6}$
	Enrollment of children in school	A school-aged child is out of school between 1 and 8 years old.	Children out of school, primary	$\frac{1}{6}$
Standard of living	**Electricity**	Households do not have electricity. [1-Access to electricity (% of the population)]	Access to electricity (% of the population)	$\frac{1}{18}$
	Access to drinking water	Access does not meet the definitions of MDGs (1) or the household does not have access to water within a 30-minute walk from their home.		$\frac{1}{18}$
	Sanitation	Sanitation does not meet MDG definitions or toilets are shared. [1-People using at least basic sanitation services (% of the population)]	People using at least basic sanitation services (% of the population)	$\frac{1}{18}$
	Soil and quality of housing	The floor of the house is dirty, made up of sand, dung, and manure.		$\frac{1}{18}$
	Cooking fuel	Food is cooked with wood, charcoal, or dung. [1-Access to clean fuels and technologies for cooking (% of population)]	Access to clean fuels and technologies for cooking (% of the population)	$\frac{1}{18}$
	Transport or communication goods owned	Of the goods owned, the household does not have more than one radio, a television, telephone, bicycle, or motorbike.	Logistics performance index: Quality of trade and transport-related infrastructure (1=low to 5=high)	$\frac{1}{18}$

Source: authors' elaboration.

3.1.2. Corruption, growth, and poverty in MENA countries

The sample of our study is composed by: Tunisia, Algeria, Morroco, Egypt, Syria, Jordan and Yemen. The choose of this sample is essential due to data availability and that these developing countries faces, approximately, the same difficulties and problems: high rate of unemployment especially among young, regional disparities, social and economic exclusion... However, despite these similarities, the MENA countries of our sample present economic disparities. They include countries rich in natural resources and manpower, namely Algeria and Syria, and other with few natural resources but abundant manpower (Egypt, Jordan, Morocco, and Tunisia). This heterogeneity causes several social issues, such as poverty and corruption.

To combat poverty in MENA region, good governance is required, that is, sound organization of administrations and their cooperation with social actors, civil society, and international institutions. Therefore, to make anti-poverty policies more efficient, it is necessary to solve the problem of corruption, intensified by the rise of an informal economy and lack of transparency in interactions between public and private agents.

The global evolution of corruption has boosted many questions. This phenomenon has increased, reaching very high levels in developing countries. In this regard, "Transparency International" has traced the evolution of the Corruption Perception Index (CPI) since 1995. This index assesses the level of corruption affecting public administration and politicians in each country. It scores and ranks countries by their perceived level of public sectors corruption. Thus, the 2021 CPI includes 180 countries, more than four times that this of 1995. For these countries, Transparency International has recent and reliable indices on corruption. It ranks countries on a scale of 0 (high degree of

perceived corruption) to 10 (low degree of perceived corruption). The evolution of corruption in our sample over the period 2010-2021 is represented in (Fig. 1) below:

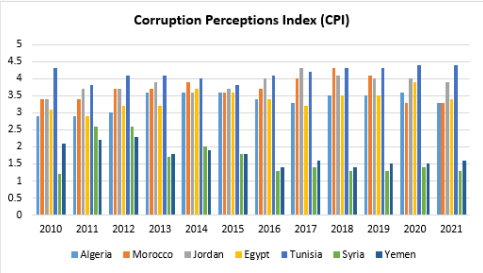

Fig. 1: Corruption Perception Index (CPI) in selected MENA countries
Source: Data compiled by the authors from Transparency International Report.

As (Fig. 1) shows, corruption is a reality in MENA countries. All seven countries have a CPI below five. Syria is the most corrupt country in our sample with a CPI varied between 1.2 and 2.6, followed by Yemen. However, Tunisia is the least corrupt country, with a CPI more than 4 and close to 5. That said, Tunisia's CPI declined for a few years in the sample period. The other countries experienced a slight decrease in corruption during 2011-2015. Since then, corruption has evolved slightly, either upward or downwards. These findings confirm the existence of "endemic" corruption in these selected countries. Is this the cause of poverty persistence in our sample countries?

Fig 2: Poverty, corruption, and growth of GDP per capita in the seven selected MENA countries

Source: Authors' calculations and elaboration from WDI, World Bank Database.

From (Fig. 2) we can see that, since 2008, the MENA countries have been affected by various shocks. The international financial and sovereign debt crises in the Eurozone severely slowed the growth of exports of goods and services from the MENA countries. Apart from these macroeconomic shocks, a political shock wave has affected several countries in the region since 2011, including Tunisia, Egypt, and Syria. These crises have penalized their growth rates. A slowdown in economic growth is accompanied by an increase in poverty and/or corruption.

In Jordan, the fall in economic growth resulted in a decline in the level of wealth per capita from more than 5 pts in 2005 to less than 6 in 2015 (-6.53), and the poverty rate doubled. Morocco experienced a decrease in growth in the gross domestic product (GDPC) per capita between 2003 and 2005. This

decrease was accompanied by an increase in corruption: its CPI decreased from 4.9 to 4.2 which means an increase in corruption by 0.7 point. For Syria, the moderation of GDPC between 2003 and 2007 by more than 5 points went hand-in-hand with a rise in the level of corruption, which increased by 0.5 point; and a more than 24 points decline in its GDPC over the 2011-2013 period increased poverty by more than 15%. This inverse relationship is also verified: the improvement in GDP per capita is correlated with the LIPM and CPI. Meanwhile, the GPDC in Egypt increased from -0.45% to more than 2% in the 2011-2015 period and from 2.12% to 3.68% in the 2017-2019 period. This positive development in Egypt was associated with a reduction in poverty and a clear reduction in corruption (the CPI increased from 2.9 to 3.5 between 2011 and 2019). However, its decrease in 2021 was accompanied by an increase in the CPI. This was also the case with Tunisia, where the fall in growth during crisis periods (2011-2019) was accompanied by an increase in corruption: the years of negative economic growth also witnessed an increase in the level of corruption. This finding is also verified for Algeria, whose increase in GDP growth went hand-in-hand with a reduction in poverty and corruption over the 2009-2015 period. The existence of a relationship among growth, corruption, and poverty was also verified for the remainder of the sample. Morocco, the period of economic growth, was associated with a reduction in poverty and the CPI rate. In Tunisia, the data show that over the 2009-2017 period, economic growth went hand-in-hand with a reduction in corruption and poverty.

Thus, these findings allow us to highlight the strong relationship among corruption, growth, and poverty. In the following section, we verify these findings empirically.

4. METHODOLOGY AND EMPIRICAL STUDY

Our empirical study of the impact of corruption, growth, and inequality on the MPI is based on a sample of the seven MENA countries for the 2003-2021 period. The choice of this study period depends on the availability of data for the group of countries studied.

4.1. Specification of the econometric model

We refer to Bourguignon (2003), who examined the triangular relationship between poverty, growth, inequality. Bourguignon's (2003) model is as follows.

Poverty = F (Inequality, Growth, Population)

We introduce other variables into the Bourguignon's (2003) model to consider the impact of corruption directly and indirectly (through economic growth) on a multidimensional measure of poverty. In addition, given the importance of the role of institutions in the prosperity of nations and in the fight against poverty, we introduce corruption into the equation of the model. The model is expressed as follows:

Multidimensional Poverty = F (Openness, Inequality, Growth Per Capita, corruption)

$$MPI = \beta_0 \text{ In } OPEN_{it} + \beta_1 \text{In } GINI_{it} + \beta_3 \text{ InGDPC}_{it} + \beta_4 CPI_{it} + \beta_5 (CPI_{it} * \text{ In } GDPC_{it}) + \varepsilon_{it},$$

where MPI is a composite poverty index calculated using three dimensions: education, health, and Standard of living (see Table1). OPEN is the open rate in logarithm, GINI is income inequality measured by the Gini index, GDPC is real GDP per capita (in constant US dollars, 2015) in logarithm, and CPI is the corruption index, (GDP*CPI) is the interaction between corruption and real GDP per capita. $\beta_1, \beta_2, \beta_3, \beta_4$, and β_5 are the parameters to be estimated in this model and ε_{it} is the error term.

4.2. Databases and presentation of variables

In our analysis, we use a series of macroeconomic and institutional indicators calculated over several years and drawn from various databases.

a- Macro-economic variables: The macroeconomic indicators used in this study are represented by MPI a multidimensional poverty index (MPI) as an endogenous variable, the level of real GDP per capita in constant US dollars 2015 taken from the World development Indicators; World Bank database. the openness rate collected from the World bank Tables database), and the level of income

inequality measured by the Gini index (GINI). The latter was obtained from the World Income Inequality database.

b- Institutional variables: Institutional variables are taken from the "International Country Risk Guide (ICRG) "database prepared by Political Risk Services. We used a single indicator called the Corruption Perceptions Index (CPI) to measure the levels of corruption in the public sectors of countries. This index was developed by Transparency International.

The descriptive statistics of the common sample are summarized in Table 2 below:

TABLE 2: Descriptive statistics of common sample*

Criteria's / Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
Multidimensional Poverty Index	2.2725	2.1036	3.8039	0.9090	0.6862	0.6793	2.5838
The Openness Rate	3.8414	3.5172	22.842	2.1576	2.9086	6.1697	40.222
Income Inequality (GINI index)	3.8011	3.8772	4.0111	3.1731	0.1747	-1.1425	3.6522
Real GDP per capita	0.2556	1.2887	17.469	-29.921	5.5920	-2.5741	13.903
Corruption index (CPI)	3.4481	3.4000	5.0000	1.8000	0.6972	0.2805	2.2858

*Observations: 133

Source: Prepared by authors.

4.3. Panel unit root and cointegration test

In this analysis, to study the effects of growth, inequality, and corruption on poverty in the MENA countries, these specific tests should be performed: the panel unit root test and panel cointegration test.

4.3.1- Panel unit root

Several unit root tests, including the method assuming a common unit root process (LLC; Breitung) and the method assuming an individual unit root process (IPS; ADF; PP) were employed. In this study, we used LLC, IPS, and ADF tests (Table 3).

Table 3: Panel Unit Root Test

		Individual intercept			**Individual intercept and trend**			**Stationarity**
Variables	Tests (methods)	LLC	IPS	ADF-Fisher	LLC	IPS	ADF-Fisher	Integ. order
MPI	level	-1.7592 (0.0393)	0.9044 (0.8171)	13.662 (0.7508)	-4.385 (0.0000)	-3.4007 0.0003)	42.977 0.0008)	**I(1)**
	first difference	--	--	--	--	--	--	
GINI	level	-5.2790 (0.0000)	-4.9707 (0.0000)	57.8086 (0.0000)	--	--	--	**I(0)**
	first difference	--	--	--	--	--	--	
CPI	level	-2.718 (0.0033)	-2.2099 (0.0136)	33.513 (0.0145)	--	--	--	**I(0)**

	first difference	--	--	--	--	--	--	
OPEN	level	2.5952 (0.9953)	3.1743 (0.9992)	9.0340 (0.9589)	-0.6814 (0.2478)	-0.1327 (0.4472)	20.872 (0.2859)	**I(1)**
	first difference	-9.1957 (0.0000)	-7.4557 (0.0000)	82.93 (0.0000)	--	--	--	
GDPC	level	-6.7573 (0.0000)	-5.387 (0.0000)	61.376 (0.0000)	--	--	--	**I(0)**
	first difference	--	--	--	--	--	--	

Note: Numbers within parentheses indicate p-values; if the positive value is greater than 5%, the variable is stationary. I(0) means integrated in the level; I(1) integrated in the first level. The significance is acquired at 1%.

Source: Prepared by authors

The results reported in the Table 3 below show that almost all variables are stationary, and therefore, are integrated into level I(0). Only the variable "Open" is not stationary at the level. Therefore, we differentiate it. As a result, all studied variables become stationary.

4.3.2- Panel Cointegration test

To test the existence of a relationship of cointegration between the variables introduced in our study, we use two tests: the Kao Cointegration Test and Johansen-Fisher Panel Cointegration Test. The results reported in Table 4 show that there is a cointegration relationship between the introduced variables. In fact, the p-value is equal to 0.0370< 0.05, which indicates that the null hypothesis (no cointegration) is rejected.

a- Kao Residual Cointegration Test

TABLE 4a: Panel Cointegration Test

Series: MPI OPEN GINI GDP*CPI GDPC CPI				
Sample: 2003 2021				
Included observations: 133				
Null Hypothesis: No cointegration				
			t-Statistic	Prob.
ADF			1.786945	0.0370
Note: The general rule is if, p-value <0.05, we reject the null hypothesis (no cointegration) mean that there is a long run associated relationship between studied variables.				

The null hypothesis for the Kao test is that there is no cointegration among the variables. This means that the variables do not share a stable long-term relationship and may drift apart over time. The table below shows that the t-statistic is 1.786945 and the p-value associated with is 0.0370, significantly below 0.05. So, we reject the null hypothesis of no cointegration: there is a long-run equilibrium relationship between the variables introduced (MPI, OPEN, GINI, GDP, CPI, and GDPC) over the observed period.

b- Johansen Fisher Panel Cointegration Test

TABLE 4b: Panel Cointegration Test				
Series: MPI OPEN GINI GDP*CPI GDPC CPI				
Date: 01/26/23 Time: 23:06				
Sample: 2003 2021				
Included observations: 133				
Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)				
Hypothesized	**Fisher Stat.***		**Fisher Stat.***	
No. of CE(s)	(from trace test)	Prob.	(from max-eigen test)	Prob.
None	62.44	0.0000	34.03	0.0020
At most 1	267.6	0.0000	208.6	0.0000
At most 2	132.8	0.0000	113.7	0.0000
At most 3	41.15	0.0002	43.35	0.0001
At most 4	12.19	0.5914	11.61	0.6375
At most 5	12.53	0.5641	12.53	0.5641
* Probabilities are computed using asymptotic Chi-square distribution.				

Source: Prepared by authors.

The Johansen Fisher Panel Cointegration Test is used to determine if there are one or more cointegrating relationships among the variables in the dataset. Both the trace test and the max-eigen test suggest that there are at least three to four cointegrating relationships among the variables in this panel dataset. This implies a strong long-term equilibrium relationship among the variables.

5. Estimations results and interpretations

This study empirically investigates the effects of income inequality, economic growth, and corruption on a multidimensional poverty measure (MPI). To do so, we estimated the effect of these factors on poverty for a sample of seven MENA countries (Algeria, Egypt, Jordan, Morocco, Tunisia, Syria, and Yemen) over the 2003-2021 period. To perform the estimations, six regression models were estimated using panel data methodology; the models (M1, M2, and M3) were used to appropriate the cross-sectional effects, and the models (M4, M5, and M6) were used to appropriate the regressions for the period effects. These cross-sections and period specifications are so important because there are some differences and economic specificities between studied countries, and also special periods in which these countries witnessed crises. Such crises include the subprime crisis of 2008, crisis of revolutions known as the Arab Spring in 2011, Covid-19 crisis of 2020, and Russian-Ukrainian war. Our interpretation results are based on models M3 and M6, selected after performing the Hausman test, which is used to determine the best method between fixed and random effects. The input results are summarized in Table 5.

TABLE 5: Estimation results and interpretations

	Specification Effects Endogenous variable: MPI					
	Cross-section Effects			**Period Effects**		
Panel Estimation Methods	**M1 PLS - Fixed effects**	**M2 PLS - Random effects**	**M3 Pooled EGLS (Cross-section SUR)**	**M4 PLS - Fixed effects**	**M5 PLS - Random effects**	**M6 Method: Pooled EGLS (Period random effects)**
Exogenous variables	Coef.(Prob.)	Coef.(Prob.)	**Coef.(Prob.)**	Coef.(Prob.)	Coef.(Prob.)	**Coef.(Prob.)**
GINI	0.4230** 0.0857	0.5441*** 0.0245	**0.1975*** 0.0205**	1.6809*** 0.0000	1.6713*** 0.0000	**1.67133*** (0.0000)**
GGDPC	-0.0818*** 0.0064	-0.0857*** 0.0042	**-0.0320*** 0.0115**	-0.1289*** 0.0136	-0.1334*** 0.0054	**-0.1334*** (0.0021)**
CPI	0.0660 0.5169	-0.0148 0.8743	**0.066516** 0.0739**	-0.3397*** 0.0001	-0.3619*** 0.0000	**-0.3619*** (0.0000)**
OPEN	0.0127 0.2700	0.0115 0.3185	**0.0085 0.2100**	-0.0073 0.7107	-0.0172 0.3452	**-0.0172 (0.2944)**
GDPC*CPI	0.0255*** 0.0079	0.0263*** 0.0060	**0.0106*** 0.0106**	0.0353*** 0.0375	0.0389*** 0.0110	**0.0389*** (0.0053)**
C	0.3603 0.7026	0.1832 0.8450	**1.2477*** 0.0003**	-2.9514*** 0.0185	-2.8061*** 0.0164	**-2.806*** (0.0096)**
Obs. (T=19, N=7)	133	133	**133**	133	133	**133**
R^2	0.7652	0.11	**0.97**	0.397	0.3624	**0.362432**
F-statistic	35.86 (0.0000)	3.1135 (0.012)	**14.4389 (0.0000)**	3.119350 0.00003	14.439 0.0000	**14.4389 (0.0000)**
DW	0.272086	1.346751	**0.9945**	0.290781	0.3155	**0.315514**
Specification test perfuming suitable method of estimation						
Redundant Fixed Effects Tests	34.604 (0.0000)			0.3465 (0.9937)		
Hausman test		**12.4826 (0.0287)**			**5.3166 (0.3785)**	
Residual Cross-Section Dependence Test						
Tests	**Statistic**	**Prop**		**Statistic**	**Prop**	
Breusch-Pagan LM	65.593	(0.0000)		78.167	(0.0000)	
Pesaran scaled LM	6.8808	(0.0000)		8.8211	(0.0000)	
Pesaran CD	-3.2404	(0.0012)		-3.1464	(0.0017)	

Note: The superscripts *, ** and *** following the t statistics represent a 10, 5, and less than 1% significant level, respectively. Source: Prepared by authors.

This table presents the estimation results for the impact of various economic indicators on the Multidimensional Poverty Index (MPI) using different panel estimation methods, and specifications effects:

– GINI: Represents income inequality. The positive and statistically significant coefficients in all models indicate that higher inequality is associated with an increase in MPI, meaning poverty levels rise as inequality increases.

– GGDPC (Growth of GDP per Capita): The negative and significant coefficients across all models suggest that economic growth has a poverty-reducing effect, as higher GDP per capita growth decreases MPI.

– CPI (Corruption Perception Index): This variable's mixed effects across models indicate that corruption's impact on poverty is somewhat complex. However, in models M4 to M6, CPI has a negative and significant coefficient, implying that higher perceived corruption (lower CPI) correlates with higher MPI, thus worsening poverty.

– OPEN (Trade Openness): The coefficients for openness are not statistically significant across models, suggesting that trade openness does not have a strong, consistent impact on MPI within this sample.

– GDPC*CPI (Interaction between GDP per capita growth and CPI): The positive and significant coefficients imply that the interaction between economic growth and corruption affects MPI positively, indicating that the effect of growth on poverty might be moderated by corruption levels.

More precisely, the table 5 shows that income inequality is positively correlated with poverty: an increase of one point (1%) in the Gini index increases poverty 0,19% by it, in the case of cross-section specification effects (M3) and by more than 1.67% in the case of period specification effects (M6). These models M3 & M6 (Pooled EGLS): This method provides estimates controlling for cross-section dependence, which can account for correlations between the countries in the MENA sample. The existence of a positive relationship between income inequality and poverty is widely discussed in economic theory (Bourguignon, 2003; Vandemoortele & Delamonica, 2022). Economic growth exerts a negative and largely significant effect on the MPI. Every one percentage (1%) point increase in economic growth reduces poverty by more than 0.032% and more than 0.13% respectively in M3 and M6. Thus, this result is consistent with the pro-poor growth thesis, which claims that growth benefits the poor (Dollar & Kraay, 2000, 2002; Dollar et al., 2016; Sala-i-Martin, 2006). Corruption, measured by the CPI, is at the origin of the accentuation of poverty in the sample of our analysis. A 1% increase in corruption, raise poverty by 0.066%. This finding is consistent with the works of, among others, Aidt and al. (2008), Devangi and al. (2013) and Kouadio and Gakpa (2022). As shown during the estimation of our model, corruption affects poverty indirectly through the channel of economic growth. The interaction between growth and corruption measured by GDP*CPI has, in fact, a positive and largely significant effect in both Poold EGLS (Cross-section SUR) and Poold EGLS (Period random effects) estimation methods. This means that corruption erodes growth and therefore decreases the rhythm of poverty reduction. This result is in line with other studies, such as D'Agostino et al. (2016) and Singh (2021).

Overall, Models M3 and M6, with high R^2 values and significant coefficients, appear to provide the most robust results among the estimations. These models suggest that income inequality (GINI) and economic growth (GDPC) are significant determinants of poverty in the MENA region. Economic growth helps reduce poverty, while inequality and corruption (CPI) exacerbate it.

6. CONCLUSION

The link between inequality, growth, and poverty has been controversial since the 1960s. Today, this topic is of crucial importance and remains at the center of interest for economists. Studies on the role of institutional quality, specifically corruption, in promoting economic growth and reducing poverty are more recent. Sufficient attention was not paid to this topic until the late 2000s due to a lack of statistics. The World Bank has also recognized the multidimensional nature of poverty since 2010. This recognition is reflected in replacing the Human Poverty Index (HPI) with a new multidimensional measure of poverty, the MPI, in Human Development Reports.

Our study seeks to contribute to the debate on the link between growth, inequality, corruption, and poverty. Referring to the economic literature, we highlight divergent views on these subjects. Concerning the link between growth and poverty, we can distinguish at least two theses. Dollar and Kraay (2000), Dollar and al., (2016), among others, maintained that growth is pro-poor while others emphasized the need to take into account inequality and argued that "growth alone is insufficient, it must be accompanied by a policy of reducing inequalities" (Kouadio and Gakpa, (2022)). Concerning the impact of corruption on poverty, the latter passes through the channel of economic growth, and

we highlight the controversy on this subject. For some researchers, corruption harms growth and therefore mitigates the rate of poverty reduction (D'Agostino et al., 2016;; Mauro, 1995; Mo, 2001). For some other researchers, corruption fosters growth and boosts investment and foreign direct investment by overcoming bureaucratic constraints (Egger and Winner, 2005; Qureshi and al. 2021).

These findings led us to study the nature of the relationship between growth, corruption, and poverty in a sample of MENA countries for the 2003-2021 period. We sought to answer questions such as: What is the effect of growth and corruption on poverty? Is growth pro-poor? is it at the root of poverty alleviation in these countries? Is corruption a factor of impoverishment or enrichment?

To answer these questions, and given that poverty is multifaceted, we first provided a multidimensional measure of poverty called MPI. As statistics on IPM are very rare for all countries in our sample, we calculated the MPI while retaining the same dimensions introduced for calculating the IPM for each country throughout the study period. Next, we conducted a descriptive analysis of the relationship between growth, corruption, and poverty. From the various graphs, we made several observations. These observations revealed that corruption is a much greater problem for all countries in our sample, and there is a robust relationship between growth and poverty on the one hand, and corruption and poverty on the other hand. Indeed, periods of economic recession are associated with an increase in poverty and/or corruption, whereas periods of growth are associated with a reduction in poverty and corruption.

These conclusions are supported by econometric panel data analysis. By estimating the impact of growth, inequality, corruption, and the interaction between these three variables on the proposed MPI, we can verify that growth is pro-poor: its impact on poverty is negative and largely significant, which allows us to attest that growth plays a very important role in poverty reduction. Meanwhile, corruption is harmful. This is the cause of the persistence of poverty: the IPC drains economic growth and negatively affects the rhythms of poverty alleviation. Thus, we conclude that the fight against corruption is an essential means of promoting well-being and reducing poverty in the sample countries. Therefore, policies focusing on fighting corruption by improving the quality of institutions are appropriate tools for further promoting growth and reducing poverty.

Highlights

• The link between inequality, growth, and poverty has been controversial since the 1960s. Today, this topic is of crucial importance and remains at the center of interest for economists.

•This study investigates the relationship between growth, corruption, and poverty for a sample of MENA countries for the 2003-2021 period.

• This study calculates a multidimensional poverty index for seven selected MENA countries.

• The analysis shows that fighting corruption by improving institutional quality is an appropriate tool for promoting growth and reducing poverty.

• Corruption affects poverty indirectly through the channel of economic growth, and the interaction between growth and corruption, measured by GDP*CPI, has a positive and largely significant effect on poverty.

AUTHOR CONTRIBUTIONS

The researchers jointly worked on the methodology, software, analysis, investigation, writing, and editing of the research paper.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY

The data that support the findings of this study are available from the author upon reasonable request.

REFERENCES

Aidt, T., Dutta, J., Sena, V. (2008). Governance regimes, corruption and growth: Theory and evidence. Journal of Comparative Economics, 36(2), 195–220

Acemoglu, D., & Verdier, T. (1998). Property rights, corruption and the allocation of talent: A general equilibrium approach. The Economic Journal, 108(450), 1381-1403.

Adams, R. H. (2004). Economic growth, inequality and poverty: Estimating the growth elasticity of poverty. World Development, 32(12), 1989–2014

Ali, H.E., 2015. The evolution of corruption and optimal level of corruption reduction: evidence from cross-country studies. In: Dawoody, A.R. (Ed.), Public Administration and Policy in the Middle East, Public Administration, Governance and Globalization, 9. Springer, New York, pp. 103–114

Anisah, A (2019); The destructive effect of corruption on economic growth in Indonesia: A threshold model. Helyon, volume 5, Issue 10

Asteriou, D. Pilbeam, K., and Tomuleasa, I. 2021; The impact of corruption, economic freedom, regulation and transparency on Bank profitability and bank stability; Evidence from the Eurozone area. Journal of Economic Behavior and organisation,184,150-177.

Balasubramanian, P., Burchi, F., & Malerba, D. (2023). Does economic growth reduce multidimensional poverty? Evidence from low-and middle-income countries. World Development, 161, 106119.

Bhalla, S. S. (2002). Imagine there's no country: poverty, inequality and growth in the era of globalization. Washington Institute for International Economics.

Bourguignon, F. (2003). The Poverty-Growth-Inequality Triangle. Agence Française de Développement /EU Development Network, Paris.

Brady, D., & Sosnaud, B. (2010). The politics of economic inequality. In K. Leicht, & C. Jenkins (Eds.), Handbook of Politics: State and Civil Society in Global Perspective (pp. 521– 541). Springer: New York.

Brady, D., Blome, A., & Kleider, H. (2016). How politics and institutions shape poverty and inequality. The Oxford handbook of the social science of poverty. Chapter 6.

Bruckmeier, K., Peichl, A., Popp, M., Wiemers, J., Wollmersh¨ auser, T., (2021). Distributional effects of macroeconomic shocks in real-time. Journal of Economics Inequality 19 (3), 459–487

Burchi, F., Espinoza-Delgado, J., Rippin, N., & Montenegro, C. E. (2021). An individual-based index of multidimensional poverty for low-and middle income countries. Journal of Human Development and Capabilities, 22(4), 682–705

Burchi, F., Malerba, D., Montenegro, C. E., & Rippin, N. (2022). Assessing trends in multidimensional poverty during the MDGs. Review of Income and Wealth, 68, S317-S346.

Cling, J. P., De Vreyer, P., Razafindrakoto, M., & Roubaud, F. (2004). La croissance ne suffit pas pour réduire la pauvreté. Revue Française d'Economie, 13(3):137-187.

D'Agostino, G., Dunne, J. P., & Pieroni, L. (2016). Corruption and growth in Africa. European Journal of Political Economy, 43, 71-88

Davina, O. Maty, K. Elvis, K A. (2024): Escaping Corruption in the Demand for Public Services in Africa-The Dual Nature of Civic Networks, World Development 177 (2024) 106541

Devangi, L., Perera, G., & Lee, H. Y. (2013). Have economic growth and institutional quality contributed to poverty and inequality reduction in Asia? Journal of Asian Economics, 27, 71-86

Dollar, D., & Kraay, A. (2000). Growth is good for the poor. "World bank. Development Research Group, Washington, DC Processed, 3.

Dollar, D., Kleineberg, T., & Kraay, A. (2016). Growth still is good for the poor. European Economic Review, 81, 68-85.

Egger, P., & Winner, H. (2005). Evidence on corruption as an incentive for foreign direct investment. European Journal of Political Economy, 21(4), 932-952.

FEI, J.C.H. et G. RANIS (1961), "A Theory of Economic Development ", American Economic Review 51 (1961), pp. 533–556.

Gupta, S., Davoodi, H., & Alonso-Terme, R. (2002). Does corruption affect income inequality and poverty? Economics of Governance, 3, 23-45.

Henri and al.,(2023)
Hodge, A., Shankar, S., Rao, D. S P., & Duhs A. (2011). Exploring the links between corruption and growth. Review of Development Economics, 15(3), 474–490.
Huang, C.J., (2016). Is corruption bad for economic growth? Evidence from asia-pacific countries. N. Am. J. Econ. Finance 35, 247–256
Kouadio, K. H., & Gakpa, L-L. (2022). Do economic growth and institutional quality reduce poverty and inequality in West Africa? Journal of Policy Modeling, 44(1), 41-63.
Leff, N. H., & Heidenheimer, A. I. (2002). Economic development through bureaucratic corruption. Political Corruption: Concepts and Contexts, 3rd Edition.
LEWIS, A.W. (1954), "Economic Development with Unlimited Supplies of Labour", The Manchester School of Economic and Social Studies, vol. 22, pp. 139-191.
Liu, F. T. (1985). An equilibrium queuing model of bribery. Journal of Political Economy, The University of Chicago Press Journals, 93(4), 760-781.
Marakbi, R. (2020). Une reevaluation de la relation entre corruption fiscal et inflation. Revue Economique 71(4), 739-750
Mauro, P. (1995). Corruption and growth. The Quarterly Journal of Economics, 110(3), 681-712.
Maxwell, S. (2001). Innovative and important, yes, but also instrumental and incomplete: the treatment of redistribution in the new 'New Poverty Agenda'. Journal of International Development, 13(3), 331-341.
Meon, P., Weill, L., (2010). Is corruption an efficient grease? World Development, 38, 244–259
Narasaiah, M. L. (2005). Corruption and poverty. Discovery Publishing House, New Delhi.
Njangan H, Asongu S A and Mouchili E(2023). Does corruption starve Africa? The mitigating effect of political distribution of power Journal of Policy Modeling,1-27
Qureshi, F., Qureshi, S., & Junejo, I. (2021). Revisiting the nexus among foreign direct investment, corruption and growth in developing and developed markets. Borsa Istanbul Review, 21(1), 80-91.
Ravallion, M. (2004). Pro-poor growth: A primer. Development Research Group, The World Bank, Washington DC.
Santos, ME., Dabus,C and Delbianco,F (2019). Growth and Poverty Revisited from a multidimensional Perspective. The Journal of Development Studies, 55(2),260-277
Singh, B. P. (2021). Institutional quality and poverty reduction in BRICS. Poverty & Public Policy, 13(4), 335-350.
Tebaldi, E., & Mohan, R. (2010). Institutions and poverty. The Journal of Development Studies, 46(6), 1047-1066.
Vandemoortele, J., & Delamonica, E. (2022). Growth is good for the poor? Not necessarily. Review of Political Economy, 1-5.
World Bank, (2020). World Development Indicator,2020.
Zaman, K., Al-Ghazali, B. M., Khan, A., Rosman, A. S. B., Sriyanto, S., Hishan, S. S., & Bakar, Z. A. (2020). Pooled mean group estimation for growth, inequality, and poverty triangle: Evidence from 124 countries, Journal of Poverty, 24(3), 222-240.