

Institutional quality and sustainability: empirical study in 11 MENA countries

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Abstract. *In this paper, we analyse the impact of the institutional quality on the sustainable development in 11 MENA countries during the period 1996-2021. Despite the significant improvement that has known some countries in recent years in terms of development indicators, the MENA authorities still require more efforts to improve their governance and to enhance the developmental impact of oil revenues. However, the deterioration of the institutional environment indicators remains the biggest obstacle to achieve the development goals, and limits the effectiveness of economic reforms. We find with FMOLS, DOLS and CCR estimations that there is a positive and significant relationship between the adjusted net saving as sustainable development factor and the institutional quality index at the level of 1%. However, when squared adjusted net savings is included, the relationship turns negative, indicating that there is still evidence of a fragile political framework and a frail understanding of politics in MENA nations.*

Keywords: institutional quality; sustainable development; MENA countries; adjusted net saving.

JEL Classification: Q01, Q56, E02, E21.

1. Introduction

The economic and development disparities between developing and developed countries are still remaining a towering interest for many consultants and authorities. In the MENA states, the term of sustainable development is getting an important attention, because it not only focusses on the nature of the economic growth, but on the institutional development over time, as well. Institutions in developing countries (MENA countries) are mainly of a nature developing redistribution activities instead of production activities, creating monopolies instead of competitive conditions, restricting opportunities instead of developing them, these institutions rarely lead to investments that will increase productivity (Yildirim & Gokalp, 2016). The distribution of political and civil rights, the quality of the legal system and government effectiveness in developing countries during the recent period affect the economic situation and the implementation of sustainable development. Knack and Keefer (1995) point out that a good policy is powerless and its fail to achieve their aims when there is poor institutional quality, a weak rule of law, and insecure property rights. Dreze and Sen (2013) demonstrate that many countries need wide-ranging reforms eradicating corruption, government accountability, fostering social equity and improving the effectiveness of administrative, judicial and legislative processes. However, some governments and multilateral agencies from developing countries focus on getting institutions right and decide to match the institutions of developed countries (Rodrik, 2008). Taylor (2009) says that the institutions can change through an evolutionary process. This was not to deny that institutions tend to persist through time and thus, may generate barriers to economic development. The argument is that these institutions slowly evolve through time because of different policies. This does not reject the possibility that sometimes events, and political contexts result in dramatic institutional changes. However, much institutional innovation appears to be the result of gradual evolution occurring over time through piecemeal change.

The MENA countries actually share much more than a common social and cultural traditions and languages (Sari-Hassoun et al., 2024). They follow almost the same and a long development model organised on the public sector and prevents the governments to providers defining the first and the last. This model depends on a defective MENA development on effective forms of non-intervention, redistribution and funding. These forms depend strongly on foreign gains, including aid and remittances wage labours from oil revenues.

Since 2011, some MENA countries have known several social issues and have sought out for appropriate development policies, which can meet their demands and supplies. In this context, the United Nations⁽¹⁾ and the International Labour Organization published a report in 2013, which argues that the market reforms aim at replacing the old social contract that is not participating. This will lead to the emergence of artificial barter misconceptions amongst economic and political rights (approach “economic reforms first, then political reforms latter” or the so-called “bread before freedom”), which were the reason of the eruption of the MENA Spring protests. According to Wathne and Stephenson (2021) the equity is responsible for the beginning of political corruption which costs roughly US \$ 2.6 trillion or 5% of global GDP (report from the UN and OECD) while for developing

countries, the corruption, tax evasion, and illicit financial flows together costs US \$ 1.26 trillion per year. But, Baskaran and Bigsten (2013) show in some Sub-Saharan Africa countries that the fiscal capacity decreases corruption and increases democracy.

Alternatively, the policy of most developing nations can influence institutional quality through the ratio of natural resource rents (both mineral and oil) to GDP. A large literature argues that such an environment is an economic as well as political curse. Political scientists find that petroleum wealth has at least three harmful effects. It makes authoritarian regimes more durable, increases the extent of corruption, and helps trigger violent conflict (Ross, 2015). The economic effect of a natural resource boom was initially analysed by Corden and Neary (1982). It shows that the natural resource booms tend to inflate real exchange rates, leading to the decline of tradable goods production, especially manufacturing. On the other hand, countries that remain concentrated on natural resource extraction would likely lead to institutional entrepreneurs seeking to weaken the institutional quality. The natural resource rents are likely to lead to a reduction in the quality of effective governance, the rule of law is likely to suffer, control of corruption is likely to decline, and the quality of regulatory institutions is likely to hurt. One might also argue that institutions providing voice and accountability are also likely to be weakened. Since 2020, the world has changed with the appearance of a COVID-19 Pandemic that has uncovered several weaknesses in societies, institutions and economies all around the world. In July 2020, the MENA region has lost US \$ 152 billion⁽²⁾ due to shock of the pandemic and low oil prices according to the International Monetary Fund⁽³⁾. The value of the MENA stock market has dropped by 23%, depriving the region of the capital that could otherwise be invested in the recovery phase.

In the light of this short overview, we shall emphatic our attention on “the Development of Political Economy”, and try to analyse the reasons behind the inefficiency of economic reforms in some MENA countries. We may also focus on the analysis of the curriculum reforms in these MENA countries and their institutional aspects. The primary contributions of this study can be summed up as follows: first, it attempts to create a model of the relationship between institutional quality and sustainable development in 11 MENA (North African and Middle Eastern) nations and to compare macroeconomic factors in those countries. Second, by incorporating new variables (adjusted net savings, total natural resource rents and squared institutional quality) compared to other studies, this novel work advances the body of knowledge. Finally, no earlier research has been done in this field specifically on the MENA nations. This paper is divided into six sections, which are introduction, literature review, methodology and data, the empirical result and discussion, policy implication, and conclusion.

2. Literature review

2.1. Institutional quality and economic growth:

Recent studies display the importance of the institutions in the process of development and economic growth in several countries. Many economists find that the difference in per capita gross domestic product around the world is closely linked to the difference in the

institutional quality. The countries that have good institutions quality will not only encourage the investment in physical and human capital, but also in high technology as well, which it will permit to improve the performance of its economy and provides a better social condition. Knack & Keefer (1995) are among the first economists who used appropriate indicators to measure the quality of institutions, in order to indicate that the countries, which possess good institutions, are those with the highest rates of economic growth. Some scholars investigate the link between institutional quality and economic growth in different regions, diverse methodologies and variables (Hall and Jones, 1999; Aron, 2000; Acemoglu et al., 2002; Easterly and Levine, 2003; Rodrik et al., 2004; Valeriani and Peluso, 2011; Han et al., 2014). While others use different variables such as a property right, governance, and democratic institutions (Rivera-Batiz, 2002; Gani, 2011; Dima et al., 2013; Bhattacharjee, 2017; Carraro and Karfakis, 2018). However, Gough et al. (2004) show that a lack of the current government in many emerging markets is the main burden in the country's development. Bhattacharjee and Haldar (2015a, 2015b) find a negative and insignificant relationship between the political stability and growth in the four major economies of South Asia. In addition, several researchers find a negative impact of inequality on institutional in their empirical support in other cross-country studies, including Keefer and Knack (2002), Alesina and Rodrik (1993), and Alesina and Perotti (1996), as well as in historical explorations such as those of Engerman and Sokoloff (2002) or Acemoglu and Robinson (2011).

Edison (2003) tests the link between the quality of institutions, policies, and the rate of growth of per capita real GDP in a group of countries (sub-Saharan Africa, the Middle East and Turkey, the developing countries of Asia, Latin America and the Caribbean). The researcher concludes that there is a statistically significant impact of institutions on economic performance, and it raises the level of per capita income. The results show that if the countries in sub-Saharan Africa can improve the quality of its institutions to the average quality of institutions in the developing countries of Asia, they will achieve an increase of 80% in per capita income, any increase from US \$ 800 to more than US \$ 1,400. Besley and Persson (2011) build a model where State capacity, political violence and income are jointly determined in an integrated formal framework. In their approach, higher income reduces the likelihood of repression and civil war by raising the opportunity cost of investing in violence, while in turn the reduction of violence contributes to economic and social progress. In the same line, there are two-way forces between income and State capacity. Fukuyama (2014) points out that the stability of the open-access order rests on its ability to provide credible commitments, and as the masses participate in this order, some form of distribution is inevitable, by way of sharing the gains of long-term economic growth. Besides, the legitimacy being conditioned by the distribution of the benefits of growth affects the power of the State. Nabila et al. (2015) analyse the impact of institutional quality on economic growth in developing economies of Asia with employing the Panel ARDL over the period of 1990-2013. Their findings show that institutional quality exerts positive influence on economic growth in addition to causality running between institutional qualities to economic growth.

Gradstein (2008) extends this model in order to endogenize political participation and policies. In his view, if inequality moderates democratization, it will follow an increase of

investment, with high levels of protection for property rights, reduced inequality, and growth. Nevertheless, if these initial conditions do not hold, then the elite will remain in power, rent-seeking activities will intensify, and investment and growth will be low. Chong and Gradstein (2007) find bidirectional causation between weak institutions and weak institutions with using a GMM dynamic panel. Alonso and Garcimartin (2013) employ 2SLS (the Instrumental Variables 2-Stage Least Squares) to study the institutional quality and some economic variables. Alam et al. (2017) employ the general methods of moments (GMM) to examine the impact of government effectiveness on economic growth in a panel of 81 countries. The study finds a significant impact of government effectiveness on economic outcomes. The policy suggestion is to focus on good governance for better economic outcomes. However, the study fails to show the impact of other indicators of good governance. Bolen and Sobel (2020) aim at studying the balance between areas of institutional quality and its repercussion on economic growth with GMM system methodology. The variables are the quality of institutions and the change in institutions, the average private and public investment rates as percentages of GDP, real GDP per capita growth, the change in human capital, the percent of the population in a tropical climate, the percent of the population within 100 km of a coast, malaria ecology, and region fixed effects. As results, they provide that policy makers should pursue a balanced institutional structure, especially in countries where at least one dimension is particularly poor. Broad reforms lifting all areas a little will generally produce more growth than a large reform to only one area, even if it results in the same change in the overall average score. Improving the weakest area scores will also contribute more to growth than improving already strong areas, even if they have the same impact on the overall average score. Alonso et al. (2020) apply GMM method to study the determinant of institutional quality and they find that income per capita (growth), tax revenue appears to be sound determinants of institutional quality. Development facilitates the building of good institutions, and from the opposite seems also to be true, a virtuous circle of growth and institutional quality emerge. On the other hand, a strong-fiscal covenant also fosters institutional quality. Regarding inequality, redistribution (rather than simple inequality) seems to play an important role as a determinant of institutional quality, as it captures the active role-played by the state in this respect.

With regard to the MENA states, Lahouij (2016) clarifies the relationship between good governance and economic growth, on a sample of six countries from the Middle East and North Africa's non-oil exporting countries during the period of 2002-2013. The author utilizes the panel random effects model, and he finds that there is a direct correlation and significant relationship between governance index and economic growth in the region, as well as all of the government spending, domestic investment, and foreign investment. However, the factor of economic freedom does not influence the economic growth in this model. In the case of MENA Petroleum Exporting Countries. Abdelbary and Benhin (2019) examine the relationship between governance, economic growth and human capital using data on MENA countries from 1995 to 2014. Their research shows that good governance has a positive impact on both economic growth and human capital.

2.2. Institutional Quality and Sustainable development

The United Nations' current policies are primarily concerned with sustainable development and its effects on long-term production and resource conservation. As a result, institutions and sustainable development are linked in the majority of the empirical literature in development economics. Market institutions are in the forefront in better executing the sustainable development agenda as we progress towards institutional dimensions, and they are now universally acknowledged as dimensions towards sustainable development (Micic 2009; Mitchell et al., 2010). According to Polasky et al. (2019), the key policy objective for developing countries is to focus on expanding both the political and market institutional roles, because most of their market regulatory institutions are poorly arranged. Therefore, they need to achieve an appropriate balance policy, and efficiency market institutional role. However, a more effective institutional framework produces greater levels of taxes that increase the system's financial capacity and support sustainable development (Gambetta et al., 2019).

In recent studies, some researchers display the importance of the institutional quality on both economic growth, and sustainable development. The following scholars (Hamilton, 1994; Hamilton and Clemens, 1999; Gnégne, 2009; Pezzey and Burke, 2014; Boos, 2015; Dupuy et al., 2017; Sari Hassoun and Ayad, 2020; Gastro and Lopes, 2021; Bergougui and Murshed, 2023) focus mainly on the variable of adjusted net saving (ANS) as they claim that it is a decent index to quantify the sustainable development in several nations. As stated by the Environment Department of World Bank⁽⁴⁾, the adjusted net saving measures the true rate of saving in an economy after considering investments in human capital, depletion of natural resources and damages caused by pollution. Adjusted net saving, known informally as genuine saving, is an indicator that aims to assess an economy's sustainability based on the concepts of extended national accounts. Arrow et al. (2004) Genuine investment or genuine savings are in a simplistic way as the sum of the values of investments or disinvestments in each of capital assets (the value of each investment being the product of the change in the quantity of the asset times the shadow value or accounting price of that asset). Atkinson and Hamilton (2003) suggest that a country's institutions may play an important role for an economy's sustainability, particularly in resource-abundant countries. The so-called resource curse – many resource abundant countries suffer from low rates of economic growth – which has been explained among other things by the quality of institutions (e.g. Rodrik et al., 2002), makes it interesting to investigate how institutional quality affects ANS, e.g. by determining the ability to invest natural resource rents in long-lasting investments. Therefore, the paper first aims to answer if institutional quality has an impact on ANS rates. Dietz et al. (2007) examine the relationship between the institutional quality and sustainable development measured by the actual savings in countries rich in natural resources. They employ three indicators in the form of corruption, the quality of bureaucracy and the role of law. They find that a decrease in the level of the corruption has a positive impact on the actual savings, so it decreases the negative impact of the abundance of natural resources on the actual savings and low-level corruption. These countries need to improve their institutional quality to achieve the objectives of sustainable development. Aidt (2009) concludes for the strong negative correlation amongst the growth in the actual savings for the individual and corruption. The outcomes show that the bad quality of

institutions and non-protection of the rights of private ownership, could explain the low level of net savings rate in the region of the Middle East and North Africa. Barbier (2010) applies the board data of African and Asian nations for the years 1970–2003 to analyse the long-term impact of corruption on sustainable development. The results confirm that corruption has a negative impact on Africa's sustainable development agenda, indicating that effective measures to combat corruption are necessary for sustainable development in Africa. The adjusted net savings are put to use for sustainable development. For corruption and sustainable development, a thorough link has been discovered in the Asian data set, but there is a distinct amount of association in the African data set. Carbonnier and Wagner (2015) show that institutions had a negligible impact on the sustainability of 104 emerging nations. They assess institutions' detrimental effects on sustainability. According to the study, excessive resource use has a detrimental impact on sustainability. In developing nations, the institutions have collapsed, which has a detrimental effect on violence. Azam et al. (2021) investigate the effect of institutional quality on sustainable development, based on total factor productivity improvements through the environmental regulatory process by way of abatement policies using an augmented endogenous sustainable growth model. They employ the fixed effects and GMM on 66 developing countries over the period of 1984-2019. Their outcomes establish a positive relationship between the institutional quality and sustainable development, especially in lower middle-income countries, which is more than low-income countries. They find also that the disaggregated performance of institutional quality variables is higher in lower middle-income countries than low-income countries. The authors identify the low legislative backing is the main issue in such countries as they need to focus on institutional implementation to design efficient and productive policy relevant to environmental resource management. Gastro and Lopes (2021) employ a logit model to analyse how e-government affects sustainable development (adjusted net savings) in 103 nations during the period of 2003 and 2018. They establish that the e-government increase the level of achieving sustainability among developing and transition countries. Bergougui and Murshed (2023) explore the relationship between adjusted net savings, natural resource and institutional quality in developing nations during the period of 1990 to 2018. The authors use instrumental variable-generalized method of moment and VDEM's new institutional dataset. They find that there is a positive and significant relationship between sustainability and institutional quality, while there is a negative and significant connection among natural resource and sustainability. Ahmad et al. (2023) employ a panel quantile estimations (MMQR) to examine the connection between natural resources rents, energy transition, financial globalisation, adjusted net savings and institutional quality in 21 emerging nations during the period of 1990-2020. They establish that the institutional quality has a positive influence on sustainability, and this show how important it is for successful institutions to support sustainable development outcomes in developing nations. This outcome makes sense because powerful institutions in creating a setting that can sustain sustainable development through fostering economic growth, preserving the environment, and guaranteeing social justice.

3. Methodology and data

3.1. Data

The institutional data are collected from the Worldwide Governance Indicators and as a result, they encompass a large variety of subjective assessments. In the analysis that follows, these serve as a gauge of present institutional quality. Therefore, due to their unavailability of such data before 1996, this study covers only the period of 1996-2021. Also, due the missing data, we shall work with only 11 MENA countries from 22 members of the MENA League, which are Algeria, Morocco, Tunisia, Libya, Egypt, Bahrain, Iraq, Jordan, Lebanon, Oman, and Saudi Arabia during the period of 1996-2021. Based on prior research on institutional, macroeconomic, and sustainable development variables, we will use six variables divided by the number of their population (per capita). The variables of this study are described as follows in table 1:

Table 1. Variable definition

Variables	Units	Data source
ANS: Adjusted net savings including particulate emission damage	current US\$ per capita	World Development Indicators
IQ: Institutional Quality	Estimation ranging from approximately -2.5 to 2.5	Mean of six measures of governance from Worldwide Governance Indicators
GDP: Gross domestic product	current US\$ per capita	World Development Indicators
TRADE: Trade Openness	current US\$ per capita	World Development Indicators
GFCF: Gross Fixed Capital Formation	current US\$ per capita	World Development Indicators
TNRR: Total natural resource rents	current US\$ per capita	World Development Indicators

The following variable definitions and units of measurement are taken from the (World Bank, 2024) and we can summarize different definition and analysis about variables from table 1:

The variable of adjusted net savings (ANS) is equal to net national savings plus education expenditure and minus energy depletion, mineral depletion, net forest depletion, and carbon dioxide and particulate emissions damage. However, we have some missing data for Algeria from 1996-2004. Therefore, to complete these data, we use linear interpolation by connecting dots in a straight line in increasing or decreasing order.

The variable of institutional quality (IQ) denotes for six criteria for measuring good governance, which are voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and corruption control. Kaufman et al. (2007) and Arndt and Oman (2006) pointed out that The World Bank Governance Indicators average (GIs) may be the best available proxy for institutional quality, not only for greater accuracy but also for the wider geographical coverage. We can also measure the international institutions with several indicators such as the Corruption Perceptions Index, the indicators of Freedom House, the Governance Index, the Political Risk Services, and the indicators of Economic Freedom...etc.

The variable of gross domestic product (GDP) is the total gross value added by all producers who are residents of the economy, plus any product taxes and less any subsidies that aren't factored into the product value. It is computed without accounting for the depletion and degradation of natural resources or the depreciation of artificial assets.

TRADE represents the value of all goods and other market services provided to the rest of the world. Balance of trade include the value of merchandise, freight, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. Trade openness exclude compensation of employees and investment income (formerly called factor services) and transfer payments minus all goods and other market services received from the rest of the world.

The variables of gross fixed capital formation (GFCF) includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchase; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. However, due the lack of this data for Kuwait, we replace the variable by the gross capital formation.

The total natural resource rents (TNRR) are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents.

3.2. Methodology

Six criteria for measuring good governance are put forth by Kaufmann et al. (2008): voice and accountability, political stability, government effectiveness, regulatory quality, rule of law, and corruption control. These measurements have an estimated range of 2.5 to -2.5; a favourable political environment will have an index close to 2.5, while a bad political environment will have an index close to -2.5. The institutional quality (IQ) is an index that combines these six Kaufmann governance metrics.

$$IQ = \frac{\text{six measures of governance}}{6}$$

Kunčič (2014) describes and debates diverse ordering systems of institutions, in order to search for some institutional quality data, which are widely used in the literature. He focusses on three sets of formal institutions: legal, political and economic. He then extracts the true underlying institutional qualities for legal, political and economic institutions and shows how the results can be used in social science research. In addition, he shows that the calculated latent institutional quality variables can easily be employed in panel data international economics applications.

Relaying to the theoretical and empirical considerations mentioned above, the following OLS regression captures the impact of institutional quality on ANS rates:

$$ANS_{i,t} = \beta_1 ANS_{i,t-1} + \beta_2 IQ_{i,t-1} + \beta_3 GDP_{i,t-1} + \beta_4 TRADE_{i,t-1} + \beta_5 GFCF_{i,t-1} + \beta_6 TNRR_{i,t-1}$$

$$ANS = f(IQ; GDP; TRADE; GFCF; TNRR)$$

$$ANS_{it} = c + \alpha_1 IQ_{it} + \alpha_2 GDP_{it} + \alpha_3 TRADE_{it} + \alpha_4 GFCF_{it} + \alpha_5 TNRR_{it} + \varepsilon_{i,t} \dots \quad (1)$$

Where ε_{it} is the error term or the error of specification and it can describe all variables that are omitted in this study in the country (i) at the time (t).

The above model focuses on two main variables, the adjusted net savings per capita is used as a proxy of sustainable development and is the output of Eq. (1), and the rest of the variables are inputs, including the institutional quality. Our model examines the function of political and economic institutions as well as the effect of interethnic conflict on sustainable development.

The econometrics methodology in this paper will first look at the descriptive statistics before doing cross-sectional dependence (CSD) analysis. CSD test assumes that the error terms in panel-data models are independent across cross sections and to test it, we use the Lagrange multiplier test statistic, which Breusch and Pagan (1980) proposed, in the setting of large T and small N (in this study, T=26 and N=11).

After confirming that there is a cross-sectional dependence between the variables, we will use The Pesaran (2007) CIPS test, which is a second generation of unit roots. In the Dickey-Fuller regression, CIPS test permits both the presence of a single and heterogeneity in the autoregressive coefficient. Cross-Sectionally Augmented Dickey-Fuller (CADF) analyses are used to describe ADF regression analyses on the cross-sectional mean values of both dependent and independent variables.

We shall proceed to the panel cointegration test of Kao (1999) after verifying the order of integration of each variable. Panel cointegration between variables can be performed using suitable models, such as canonical cointegration regression (CCR), dynamic ordinary least squares (DOLS), and fully modified ordinary least squares (FMOLS), which take into account cointegrated panel data with homogeneous long-run covariance structure among cross-sectional units and non-stationary cointegrated variables (I(1)).

The long-term relationship between the co-integrating equation and the shocks in stochastic regressors is the reason behind the selection of these estimation techniques. The Fully Modified Ordinary Least Squares (FMOLS) estimator is a process that is based on semi-parametric correction and was proposed by Phillips and Hansen (1990). Shaari et al. (2016) suggested this technique in the case of non-stationary cointegrated variables (I(1)). The FMOLS estimator is calculated according to the following equation:

$$\hat{\theta} = \begin{bmatrix} \hat{\beta} \\ \hat{\gamma}_1 \end{bmatrix} = \left(\sum_{t=2}^T Z_t Z_t' \right)^{-1} \left(\sum_{t=2}^T Z_t ANS_{i,t} - T \begin{bmatrix} \lambda_{12} \\ 0 \end{bmatrix} \right) \quad (2)$$

Where $Z_t = (X_t', D_t')$ and λ_{12} is the cross-correlation between the cointegrating equation errors and the regressors.

Moreover, Park (1992) presented the estimator of Canonical Co-integrating Regression (CCR), which shares a close relationship with FMOLS. Asymptotic Chi-square testing is possible with the CCR procedure, The CCR procedure follows a mixture normal distribution free of non-scalar nuisance coefficients and allows asymptotic Chi-square testing. Through this method, the endogeneity resulting from the long-term correlation between the shocks of the stochastic regressors and the residuals of the co-integrating equation is eliminated. We can write the CCR estimator equation as follow:

$$\hat{\theta} = \begin{bmatrix} \hat{\beta} \\ \hat{\gamma}_1 \end{bmatrix} = \left(\sum_{t=1}^T Z_t^* Z_t^{*'} \right)^{-1} \sum_{t=1}^T Z_t^* ANS_{i,t}^* \quad (3)$$

Where $Z_t^* = (Z_t^{*'}, D_{1t}')'$

Furthermore, Stock and Watson (1993) recommended another technique, the Dynamic Ordinary Least Squares (DOLS) estimator proposed. This estimation method is better than FMOLS and CCR, because it eliminates the correlation between the regressors (Kao and Chiang, 2001).

This estimator's principal concept is the augmented co-integrating equation by introducing the lags of the independent variables (ΔX_t) in order to offer co-integrating equation error term that is orthogonal to the full history of the stochastic regressor shocks as follows (Where δ_k are the parameters for the variables lags):

$$\begin{aligned} ANS_{i,t} = & \beta_1 ANS_{it-1} + \beta_2 IQ_{it-1} + \beta_3 GDP_{it-1} + \beta_4 TRADE_{it-1} + \beta_5 GFCF_{it-1} \\ & + \beta_6 TNRR_{it-1} \\ & + \sum_{j=1}^p \gamma_{1i} \Delta ANS_{it-j} + \sum_{j=1}^p \gamma_{2i} \Delta IQ_{it-j} + \sum_{j=1}^p \gamma_{3i} \Delta GDP_{it-j} \\ & + \sum_{j=1}^p \gamma_{4i} \Delta TRADE_{it-j} + \sum_{j=1}^p \gamma_{5i} \Delta GFCF_{it-j} + \sum_{j=1}^p \gamma_{6i} \Delta TNRR_{it-j} \\ & + \mu_{1t} \quad (4) \end{aligned}$$

Where β_k indicates the long run coefficients, while γ_{ki} denotes the short run coefficients

4. The Empirical Result

4.1. Descriptive statistics

It is important to review some preliminary statistical data before beginning the main analysis. Table 2 shows the descriptive statistics of the dataset. The average value of ANS is 504.962, varying in magnitude from -2305.613 to 7213.031. This shows that Oman and Lebanon have the lowest levels and negative data, indicating that they have a negative rate of economic saving and little investment in human capital. This demonstrates that, in comparison to other MENA nations, they are far from achieving the goals of sustainable development. Besides, the average value of IQ is -0.507, with fluctuations ranging from -1.9094 to 0.4567. It reveals that these 11 countries have a mediocre governance index and perform below averagely, highlighting the brittleness of their institutional environments. This result reveals that the institutional quality is rated as being very poor, and their political status is considered as average. The average value of GDP is 7601.258, with fluctuations ranging from 482.1636 to 26850. These statistics show that the average of the economic growth of these nations is below the world GDP per capita for 2021, which was \$12647. The average value of Trade is 7350.739, with variations ranging from 0.129 to

49485.33. This shows that these nations rely on export and import to enhance their economy and the variable of trade demonstrates how well-prepared these countries are for development, job creation, and the eradication of poverty. Trade provides domestic businesses with more market opportunities, increased productivity, and competition-driven innovation. The average value of GFCF is 1797.249, with variations ranging from 3.541 to 7994.008. this variable display that some of these countries heavily rely on domestic investment and they have significant revenues to invest it in selling off their fixed assets. The average value of TNRR is 1917.614, with variations ranging from 0.059 and 11673.73. It shows how some MENA nations manage their economies through the use of natural resources, while others do so through the use of other sectors. However, these series do not follow a normal distribution because the Jarque-Bera probabilities are inferior to 0.05.

Table 2. Descriptive statistics

	ANS	IQ	GDP	TRADE	GFCF	TNRR
Mean	504.962	-0.507	7601.258	7350.739	1797.249	1917.614
Median	245.4830	-0.3561	4307.720	3649.248	996.654	513.1151
Maximum	7213.031	0.4567	26850	49485.33	7994.008	11673.73
Minimum	-2305.613	-1.9094	482.1636	0.129	3.541	0.059
Std. Dev.	1438.712	0.5760	6992.436	9137.261	1936.828	2607.092
Skewness	1.804	-0.7238	1.33	2.25	1.591	1.646
Kurtosis	8.125	2.728	3.537	8.194	4.305	5.210
Jarque-Bera	468.314***	25.856***	88.195***	564.055***	141.048***	187.411***
Probability	0	0	0	0	0	0

4.2. CSD test

The result of CSD examination is displayed in table 3, and it indicates that all series probabilities are inferior to the level of significant, meaning that we cannot reject the alternative hypothesis and we rather accept it.

Table 3. CSD test

	Statistic	Prob
ANS	307.91***	0
IQ	436.38***	0
GDP	1048.27***	0
TRADE	1068.60***	0
GFCF	861.47***	0
TNRR	819.69***	0

Note: ‘***’, ‘**’, ‘*’ refer to the confidence interval at 99%,95%, and 90%.

Based on the results, we can definitively say that these eleven MENA nations share a similar socioeconomic status and have a neighbouring effect. Therefore, a sudden shock in one country could have a similar effect on the MENA region's economic conditions. These findings also indicate that we must perform the second-generation panel unit root test, which accounts for cross sectional dependence.

4.3. CIPS tests

After establishing the existence of cross-sectional dependence between variables, we shall examine the second-generation panel stationarity test. Table 4 shows the Pesaran panel CSD unity root as follow:

Table 4. *CIPS Test*

Variables	Without constant or trend		With constant		With constant and trend		Order of integration
	Zt-bar statistic	p-value	Zt-bar statistic	p-value	Zt-bar statistic	p-value	
ANS	-0.202	>0.10	-1.65	>0.10	-2.64	>0.10	I(1)
D_ANS	-2.74***	0.01<	-2.43**	0.05<	-3.89***	0.01<	
IQ	-1.39	>0.10	-1.952	>0.10	-1.92	>0.10	I(1)
D_IQ	-3.33***	0.01<	-3.02***	0.01<	-9.86***	0.01<	
GDP	-0.47	>0.10	-0.85	>0.10	-2.01	>0.10	I(1)
D_GDP	-1.82**	0.05<	-2.13*	0.10<	-4.74***	0.01<	
TRADE	-1.04	>0.10	-1.26	>0.10	-3.11***	0.01<	I(1)
D_TRADE	-2.35***	0.01<	-3.02***	0.01<	-3.50***	0.01<	
GFCF	-1.06	>0.10	-1.96	>0.10	-2.98**	0.05<	I(1)
D_GFCF	-1.99***	0.01<	-2.59***	0.01<	-7.86***	0.01<	
TNRR	-233***	0.01<	-1.58	>0.10	-2.31	>0.10	I(1)
D_TNRR	-2.99***	0.01<	-2.49**	0.05<	-2.91**	0.05<	

Note: ‘‘***’’, ‘**’, ‘*’ refer to the confidence interval at 99%,95%, and 90%. (>) means superior to 10%, 5% or 1%, while (<) means inferior to 10%, 5% or 1%.

The results demonstrate that all of the variables are stationary at first difference, or first integrated I(1). The results offer an important conclusion for selecting the best method for cointegration relationship analysis.

4.4. Kao cointegration test

After confirming that all variables are first integrated, we shall run the Kao cointegration test and the result is in the following table:

Table 5. *Kao panel cointegration result*

ADF	t-Statistic	Prob.
	-5.282***	0

Note: ‘‘***’’, ‘**’, ‘*’ refer to the confidence interval at 99%,95%, and 90%.

The result from table 5 indicates that the probability of the Kao statistic is below the significant level. Thus, there is a long-term cointegration between the variables, indicating that ANS and the exogenous variables are cointegrated. Now that cointegration has been found, we can focus on the estimation of FMOLS, DOLS, and CCR models, which generally produce the most reliable results.

4.5. Long run estimation and discussion

Several intriguing findings are displayed in the following table:

Table 6. *Long-run results*

Variables	FMOLS		DOLS		CCR	
	Coefficient	Prob	Coefficient	Prob	Coefficient	Prob
IQ	1010.938***	0.0003	741.137*	0.0525	431.39**	0.04
GDP	-0.108**	0.0499	-0.338***	0.0002	-0.03***	0
TRADE	0.036	0.1832	0.06	0.1544	0.09	0.606
GFCF	0.353**	0.0133	1.04***	0.0001	0.28***	0
TNRR	0.402***	0	0.109	0.2471	0.452***	0
intercept	86.884	0.774	-45.014	0.933	86.903	0.779
R ²	0.783		0.967		0.572	

Note: ‘‘***’’, ‘**’, ‘*’ refers to the confidence interval at 99%,95%, and 90% level.

Table 6's results demonstrate that the coefficient of determination (R²) for each of the three estimation techniques is acceptable. Additionally, every variable is significant at the 1% and 5% levels, with the exception of Trade and TNRR (in DOLS estimation) which are insignificant.

The sign of IQ is positive and significant, meaning the sustainability is supported by the actual level of institutional quality. The policies that encourage increased capital accumulation seem respectable in terms of some aspects of institutional quality; however, as these nations' institutions are dependent on natural resource rents, they seem to be plagued by a resource curse. This result is consistent with the outcomes of Azam et al. (2021), Ahmad et al. (2023) and Bergougui and Murshed (2023). However, a number of factors, including a high level of corruption, bureaucracy, resource dependence, ethnic issues, and the effects of the MENA Spring in 2011, causes the low institutional quality or poor institutional situation in MENA countries.

The coefficient of GDP is negative and significant, meaning that the factor of economic growth does not support the sustainability. This result is inconsistent with the outcomes of Ahmad et al. (2023) and Bergougui and Murshed (2023). Thus, there is usually a corresponding decline in one's capacity to invest and save, and not allowing funds to be allocated to projects that promote sustainability. Also, the economic development problems appear to necessitate a transformation of institutional structures in many of these MENA countries. But, economists know very little about how such institutional transformations take place. However, the institutional change is frequently a slow, piecemeal process, and policy can play an important role. Many developing countries have weak states, and the strength or weakness of the ruling elite varies dramatically by geography. Thus, policy direction can change the incentives that bureaucrats and economic actors face, resulting in small changes in the formal and informal rules (institutions) that govern economic activities. Additionally, this result show that there is a serious issue with ethnic conflict, income inequality, and health for such developing countries. The nature of significant revolutions in non-democratic nations is inherently ambiguous; neither the motivation behind them nor their effects are immediately apparent, leaving the future of MENA politics up in the air. Neither economic growth nor sustainable development are aided by this result.

The sign of TRADE is positive, but insignificant, indicating that these countries' import and export levels contribute to sustainability, albeit inefficiently. Azam et al. (2021) say in this circumstance that trade openness has a positive multiple outcome on the structure of the local economy, influencing factors such as production aspects, economies of scale, and technology diffusion. While, encouraging technology diffusion is crucial to achieve sustainable development especially in developing countries such as MENA countries.

The variable of GFCF is positive and significant, meaning that the investment in such countries is efficient and it can encourage the achievement of sustainable development goals but the side effects of negative environmental investments in Arab states have exceeded the positive economic returns through increased emissions. Also, it can be linked to particular investments in the hydrocarbons sector.

The sign of total natural resource rents is positive and statistically accepted, therefore this result is consistent, because almost all MENA countries are depending mainly on fossil fuel to develop its industry and economic sectors, but to reach the goal of the sustainable development, such countries need protecting the energy resources and preserving natural resources (especially the fossil fuel), sustainable consumption, production, and sustainable transport (Chekouri, et al., 2017b; van Kreveld, 2021). These countries also suffer from the Dutch disease theory or the resource curse assumption, which drains their abundant reserves without investing in their human or material capital assets. Instead, they consumed wealth and economic well-being in the present at the expense of the future for the following generations, especially in light of the decline in institutional quality (Chekouri et al., 2017a; Chibi et al., 2019a). Contrary to other MENA nations, which also experience problems with foreign income, foreign aid, and remittances, this finding shows that these sources are positively correlated with actual savings (as we have seen with oil rents) and net transfers through higher investments in physical capital, or recipient families' investments. This result, however, is at contradiction with those of Ahmad et al. (2023) and Bergougui and Murshed (2023), who demonstrate that there is a negative correlation between ANS and natural resources.

We do long run estimation with the addition of squared IQ to verify whether there is a true positive and significant relationship between institutional quality and sustainability. The results are shown in the table below:

Table 7. Long-run results with squared IQ

Variables	FMOLS		DOLS		CCR	
	Coefficient	Prob	Coefficient	Prob	Coefficient	Prob
IQ	415.85	0.5232	-1318.46	0.1477	-2385.4***	0
IQ ²	-281.75	0.3287	-1088.28***	0.0068	-1519.28***	0
GDP	...	...	...	...	...	...
TRADE	...	...	...	...	...	...
GFCF	...	...	...	...	...	...
TNRR	...	...	...	...	...	...
intercept	...	...	...	...	...	...
R ²	...		...		...

Note: ‘***’, ‘**’, ‘*’ refers to the confidence interval at 99%,95%, and 90% level.

From table 7, we need to display only the introduction of squared IQ on the model and what will happen to the institutional quality. The results from DOLS and CCR display that IQ and IQ² have a negative and significant coefficient, meaning that the sustainability is not supported by the actual level of institutional quality as remains below a certain threshold. The results also indicate that institutional quality is still below a certain threshold and that policies encouraging increased capital accumulation seem to be detrimental to certain aspects of institutional quality. It could also be that because of reliance on rents from natural resources, institutional quality appears to be beset by a resource curse.

5. Policy implication

The findings from table 6 and 7 show that the MENA countries' institutional quality falls short of what is required for sustainable development, and the difficult political

environment they currently face makes achieving sustainable development goals difficult. Because of the numerous factors that contribute to this negative coefficient, it is obvious that institutional quality and sustainable development are related in these nations. The growth of interethnic and interreligious conflict, bureaucracy, political freedom and civil rights, the economy, the socialist system's influence, and weak market-controlling institutions.

The impact of political right and civilities freedom on sustainable development factor indicates the weakness of political structures and democratic character in these MENA countries, but it indicates the lack of adequate indicators of the culture and environment of MENA societies, which have mostly a weak political awareness factor. Chibi et al. (2019b) state that some MENA countries need to pay more attention to the fiscal policy and efficiently control the budget deficit to avoid the debt crisis.

Since their independence, the MENA countries have known some economic transformations experienced from a planned economy to a free economy system, and the consequent changes, particularly in foreign trade liberalization, price liberalization, reforms in the economic institutions, the banking system, and the exchange rate system (Sachs et al., 1995). Some policymakers did not give a real attention to the institutional aspect and tried to improve this part by changing laws and official organizations.

The accumulations, customs and behaviours inherited from the former socialist system to delay the economic reform policies and the process of transition to a market economy. These reform programs implemented by the mid-1980s and the beginning of the 1990s under the auspices of the international institutions, required radical changes by invoking the approach of the liberalism, because these countries were driven by the socialist ideology. Therefore, such countries were required to have a group of conditions, whether the informal institutions will accept this change or not, but in the case when they do not keep pace with changes in official institutions, it will not achieve the reform efforts and the planned objectives. Despite the fact that some of these countries have positive human development indicator, they still suffer from corruption, nepotism, rent-search behaviour, which is considered as one of the most important physiognomies of the informal institutions in the MENA States, these negative characteristics will not change, and it will remain inconsistent with official institutions.

According to Bergougui and Murshed (2023), it would be advantageous for nations to follow the "Hartwick rule" when determining how to allocate the money made from the sale of natural resources. The Hartwick rule supports the notion that nations should not deplete their natural resources without also accumulating other types of capital. Reinvesting resource rents into the creation of human capital allows nations to meet current needs in a sustainable manner while preserving the prospects and well-being of future generations.

Frankel (2010) and Van Der Ploeg (2011) said that natural resources have been blamed for a variety of pathologies in parallel literatures in political science and economics for decades. The extraction, transportation, and export of hydrocarbons and minerals are believed to vitiate the rule of law and jeopardize property rights. As a result, they impede

economic diversification and slow economic growth. Instead, they encourage wasteful rent-seeking and corruption. This exacerbates gender inequality, fuels civil strife, and promotes authoritarianism.

According to the resource curse theory, natural resource exports, particularly oil, are an external, unearned, and "easily capturable" source of rents. This severs the fiscal link between rulers and the ruled and renders the former unaccountable to the latter. Once rulers are freed from taxing their citizens, they are freed from having to solicit their consent or input. When rulers are no longer required to tax their subjects, they are no longer required to seek their consent or input. Natural resource revenues thus increase the power of executives and the bureaucracy while also providing numerous opportunities for rent-seeking and corruption. Contrary to popular belief, while these rents may extend tyrants' reigns, they may also spark civil wars in pursuit of this valuable prize (Menaldo, 2016)

Nowadays, the crucial element in enhancing the sustainable development and economic growth of such MENA countries is institutional quality. Ineffectiveness and political instability are the results of poor government performance on sustainable development. Weak institutions exacerbate the economic, social, and environmental conditions in these nations, whereas strong institutions improve them. Regarding the consequences for policy, we think that by bolstering their institutions, MENA nations can achieve sustainable development—that is, economic growth while maintaining the quality of their economic situation. To achieve sustainability, governments should establish efficient social and economic monitoring, increase environmental literacy among the populace, and firmly enforce environmental systems and regulations through proactive policies.

In the fight for structural poverty reduction and sustainable development, institutional development is a crucial weapon. Even while donor agencies have agreed on this and it has been reflected in new policy, there is still a long way to go until it is really implemented.

6. Conclusion

In this study, we attempt to examine the effect of institutional quality on sustainable development in 12 MENA nations from 1996 to 2020. We focus on two main variables, the adjusted net savings, including particulate emission damage, and the index of institutional quality, which is created by averaging the six governance indicators developed by Kaufmann.

We find in the equation (4) that the institutional quality has a negative and significant impact on the sustainable development factor at the level of 1%, which demonstrates that the MENA governments have direct impact on adjusted net savings.

We establish in the equation (5) that there is a significant positive sign of trade openness, and natural resource rents on the institutional quality. However, the squared institutional quality, gross fixed capital formation, foreign direct investment and labour force, have a statistically negative effect on the institutional quality.

Due to the endogeneity issue, the general model does not support OLS estimation ; as a result, we estimate again the equation (4) using TSLS method and use equation (5) as instruments. We discover that there is a 1% negative and significant relation between institutional quality, squared institutional quality and sustainable development, indicating that the political stability, government effectiveness, regulatory quality, rule of law, and corruption control conditions in 12 MENA countries do not support the achievement of the sustainable development goals.

Despite the remarkable improvement witnessed by some states in recent years in terms of development indicators resulting from the efforts of governments, these countries still require additional efforts to enhance the developmental impact of particular oil revenues. Nevertheless, the deterioration of the institutional environment indicators represents the biggest obstacle to achieve the development objectives, and it limits the effectiveness of economic reforms.

Expanding populations, erratic economic growth, poor management of economic and natural resources, a complete lack of citizen participation in political decision-making through democratic institutions, ongoing-armed conflict, and other forms of political violence have all contributed to the current state of affairs in the MENA world, which is marked by a number of unsettling realities in several related areas. The most significant are marginalization and alienation of citizens, poverty, inequality, vulnerability, social protection, and political participation. The region did not suddenly fall into this unhealthy state over the past ten years; rather, many of the issues of today can be explained by the region's history of erratic governance over the previous century.

We conclude from previous results (negative sign of IQ index) that there is an urgent need to agree on the implementation phases of the market reform, which is not only the rise of the growth rate, but to achieve an operational growth, the income distribution, and to ensure the sustainable development as well. All of these requirements, and many others, cannot be achieved, only with a genuine institutional reform (A radical change in the rules of the game), which can be one of the appropriate choices for the decision-makers at all levels, and far away from the tribal and partisan nominations based on the loyalty. The guarantee of such choices will ensure automatically the most of the daily decisions taken, if not all, these decisions are consistent and serve the rest of the decisions of other actors. Thus, all of these resolutions will serve the achievement of sustainable development with a good human face.

The MENA authorities should work on change of some informal rules that delay the progress of reforms, and which are not easy to adopt, but it requires too much time and great efforts to be done. They should also build a society and government without all kinds of the corruptions, if the states wish to rebuild confidence between formal institutions and citizens, because the trust represents an essential element in order to reduce restrictions on non-official institutions, and then, it will increase the flow of productive investment and reduce economic exchange costs between economists' dealers. A strong institutional foundation enables one to influence the contexts of economic trade and significantly influence the economic growth and sustainability of nations.

However, we should stress on the importance of maintaining and preserving the old rules applied (efficient rules), and do not eliminate and remove them totally only after making sure of the success of the new rule's application. For example, we cannot eradicate the business sector completely, but only if the private sector starts and realise an efficient and successful results and reduce the unemployment.

Our study has several limitations. First, we employ a panel data only. Using country analysis may be worthwhile to expand the empirical research in order to learn more about how an improving institutional quality in one MENA country can support the adoption of sustainable development. Second, we only utilized one institutional quality indicator. Future research may create a more comprehensive composite measure of institutional quality incorporating a variety of governance, regulatory, and enforcement-related indicators. Finally, the data availability in MENA countries, which it is difficult to make a proper model.

The limitation of this topic and for further research, we can focus on the connection between the institution quality and the environment degradation as the main element of sustainable development. Ibrahim and Law (2016) consider that the institutional quality (rules of law, risk of expropriation, corruption, and quality of bureaucracy) is a less considered factor in terms of the causes of environmental degradation. Hunjra et al. (2020) found that the institutional quality moderates the negative impact of financial development on environmental sustainability.

Notes

- (1) https://unctad.org/system/files/official-document/tdr2013_en.pdf
- (1) The United Nations Economic and Social Commission for West Asia estimates
- (1) https://unsdg.un.org/sites/default/files/2020-07/sg_policy_brief_covid-19_and_arab_states_english_version_july_2020.pdf
- (1) https://ec.europa.eu/environment/beyond_gdp/download/factsheets/bgdp-ve-ans.pdf

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