Fatah, Omed Rafiq; Altaee, Hatem Hatef Abdulkadhim

**Article**

# The Role of Political Stability in Nine Arab Natural Resource-Abundant Countries (ANRAC) Toward Environmental Sustainability through CO2 Mitigation

International Journal of Energy Economics and Policy

ISSN: 2146-4553

available at http: www.econjournals.com

International Journal of Energy Economics and Policy, 2024, 14(3), 28-37.

# The Role of Political Stability in Nine Arab Natural Resource-Abundant Countries (ANRAC) Toward Environmental Sustainability through $CO_2$ Mitigation

**Omed Rafiq Fatah[1], Hatem Hatef Abdulkadhim Altaee[2]*,**

[1]Department of Law, Cihan University Sulaimaniya, KRD, Iraq, [2]Department of Accounting, Cihan University Sulaimaniya, KRD, Iraq. *Email: hatm.hatf@sulicihan.edu.krd

**Received:** 30 October 2023 **Accepted:** 20 March 2024 **DOI:** https://doi.org/10.32479/ijeep.15346

**ABSTRACT**

This study examines the intricate interplay of political stability, natural resource rent, industrialization, globalization, economic growth, and carbon emissions in nine Arab resource-abundant countries (ANRAC) from 1996 to 2019. Applying advanced statistical approaches, such as the Method of Moment Quantiles Regression (MMQREG) as a baseline estimation approach, along with the inclusion of PCSE, FGLS, and FMOLS, to enhance, to enhance the reliability and stability of the obtained results. The study results suggest that globalization, coupled with the interplay between political stability and economic growth, fosters advancements in environmental conditions and the pursuit of sustainable practices. In contrast, political stability, abundant natural resources, sustained economic expansion, and widespread industrialization are associated with increased $CO_2$ emissions, posing detrimental effects on the environment. Notably, there seems to be a correlation between the concurrent improvement of political stability and economic growth and a reduction in $CO_2$ emissions.

**Keywords:** Environmental Sustainability, Political Stability, Globalization, Industrialization, Natural Resources, Arab Natural Resource-Abundant Countries

**JEL Classifications:** Q5, P42, Q14, Q56

## 1. INTRODUCTION

The remarkable economic boom that ensued from the Industrial Revolution gave rise to unprecedented growth; nonetheless, it also engendered substantial environmental degradation, driven by the escalation in Greenhouse Gas (GHG) emissions and the depletion of natural resources. Environmental degradation has catalyzed global recognition and initiatives to address this issue. International organizations such as the United Nations Environment Program (UNEP) and accords such as the Paris Agreement have been instituted to bolster worldwide environmental preservation efforts and foster sustainable practices adoption. The motivation to address environmental deterioration is driven by acknowledging the need to balance economic advancement with responsible environmental management (Rockström et al., 2009).

Global carbon dioxide emissions have exhibited a notable and substantial rise over the time, with a significant portion attributed to Arab natural resource-abundant countries (ANRAC). According to Sirag and Talha (2023), the emissions in the Arab area were more significant than those in South Asia, sub-Saharan Africa, Latin America and the Caribbean, and the rest of the globe.

According to the Global Carbon Budget report of 2022 (Friedlingstein et al., 2022), the collective contribution of a particular entity in the year 2000 accounted for around 3.25% of the total global carbon dioxide emissions. However, there was an increase in this ratio, reaching over 4.75% in 2019, indicating a significant rise in their carbon footprint (World Bank, 2023). The increasing trend highlights the amplified environmental consequences of these economies within the broader climate change framework, thus requiring heightened efforts to implement sustainable energy transitions and reduce emissions.

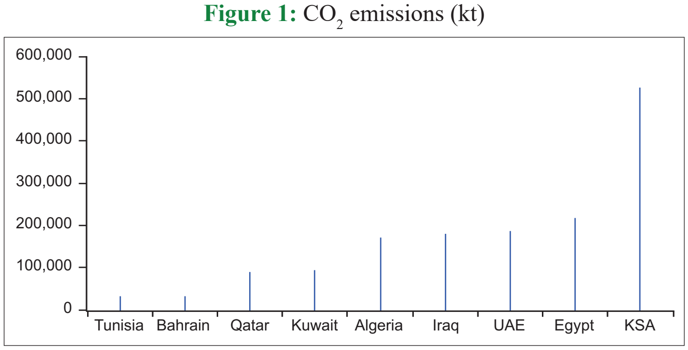
In Figure 1, the individual contributions of the nine countries are arranged on the X-axis from the lowest emitting to the highest emitting, while their 2019 emissions are depicted on the Y-axis.

The origins of contamination encompass a variety of sources, including military bombs employed throughout conflicts spanning from 1991 to 2003, as well as those arising from military research and weapons experimentation (Fathi et al., 2013). Moreover, the combined repercussions of civil wars and the war on terrorism have devastated Iraqs land, air, water, and health infrastructure (Al-Shammari, 2016).

Likewise, in the context of the Iraq-Kuwait conflict in 1991, the Iraqi military deliberately set fire to almost 92% of the total oil wells in Kuwait creating a massive environmental hazard (Mukhopadhyay et al., 2008). Additionally, the fighting resulted in the damage of dams and wastewater treatment facilities. In a comparable vein, armed conflicts such as Afghanistan, Iraq-United States, and Israel-Lebanon wars have significantly degraded the air, water, and land, giving rise to many environmental challenges throughout the affected region.

In the last 20 years, the Arab area has experienced various political power structures and governmental systems. Egypt and Tunisia underwent political transformations from autocratic regimes to more democratic systems, as observed during the period commonly called the Arab Spring uprisings (Lynch, 2012). On the other hand, it can be observed that Saudi Arabia has managed to avoid immediate instability. However, it is essential to acknowledge that the Al Saud family is currently facing persistent pressures, necessitating domestic reform implementation (Mabon, 2012). The United Arab Emirates has maintained authoritarian monarchies characterized by their dependence on traditional power systems, sometimes known as tribal autocracies. According to Kourgiotis (2020), the Middle Eastern nation is described as moderate and likely the most liberal Islamic country. Moreover, it is worth noting that certain countries, such as Iraq and Syria, had substantial

**Figure 1:** $CO_2$ emissions (kt)




Source: World development indicators

disruptions due to conflicts, resulting in notable changes in power dynamics and governance frameworks (Mabon, 2019).

Throughout history, numerous instances have illustrated that nations with economic disadvantages are prone to encountering heightened political disputes compared to their more developed counterparts. The political stability of a nation is a significant factor in influencing various economic outcomes, such as the formulation and implementation of environmental laws and regulations. Political stability is a crucial factor that significantly affects the direction and work of the nation-building process. Przeworski et al. (2000) argue that there exists a trade-off between democracy and development on a global scale. Nations that can retain political stability effectively manage their resources, implement enduring legislation and policies, and attract foreign direct investments. These factors ultimately promote sustainable development (Böhringer and Rutherford, 2010; Adebayo and Acheampong, 2022).

However, it should be noted that institutional variables, particularly political instability, can impede development endeavours, delay the establishment of institutions, and undermine social cohesiveness (Collier et al., 2009).

Furthermore, political stability fosters increased investments in environmentally friendly technologies and sustainable infrastructure. Enhanced political stability promotes investor confidence, leading to augmented financial support for renewable energy initiatives and energy-efficient technology, culminating in a decline in carbon dioxide emissions. Moreover, a politically stable environment is crucial in facilitating the efficient distribution of information and awareness campaigns about climate change and its consequences (Oates, 1985). This enables governments to communicate with their constituents, educate the population about sustainable practices, and foster active participation in climate-related projects. According to Al-Mulali and Ozturk (2015), political instability is a prominent determinant of environmental degradation in the Middle East and North Africa (MENA) region.

The region had a notable surge in its industrial development, which holds significant importance for the local economy. This growth is a crucial income source through trade, contributes to expanding employment opportunities, and enhances the value of primary products (Al-Mulali and Ozturk, 2015; Camara, 2023). However, it is worth noting that a considerable proportion of the industrial operations in this area are derived from petroleum and natural gas extraction. Moreover, the regional allocation of capital stock across several businesses within the vicinity must be updated and characterized by significant environmental degradation. Consequently, the industrial sector can contribute to the observed environmental degradation in the region.

This study contributes to the existing scholarly discourse on the relationship between political stability and environmental sustainability through various means. Firstly, this study aims to expand the comprehension of environmental concerns within the ANRAC region from 1996 to 2019. Furthermore, using an appropriate environmental econometric approach effectively

**Table 1: Summary of the literature**

| Author and date | Study area and period | Method (s) | Outcome |
|---|---|---|---|
| Economic growth | | | |
| Kirikkaleli and Osmanli (2023) | Turkey (1990-2019) | NARDL, DOLS | Valid EKC |
| Bunnag (2023) | Thailand (1971-2014) | ARDL | Valid EKC |
| Ahmed et al. (2022) | Asia-Pacif. (1995-2020) | ARDL | Valid EKC |
| Zafar et al. (2020) | 46 Asian (1991-2017) | FMOLS | Valid EKC |
| Al-Mulali et al. (2015) | 93 Global (1980-2008) | GMM, FEM | Valid EKC |
| Political stability | | | |
| Kirikkaleli and Osmanl (2023) | Turkey (1990-2019) | NARDL, DOLS | PS↑Env. |
| Agheli and Taghvaee (2022) | 43 Asian (2000-2019) | FEM, RFM | PS↑Env. |
| Sohail et al. (2022) | Pakistan (1990-2019) | ARDL | PS↓$CO_2$ |
| Abid (2016) | SSA (1996-2010) | GMM | PS↓$CO_2$ |
| Al-Mulali and Ozturk (2015) | 14 MENA (1996-2012) | FMOLS | PS↓FP |
| Natural resources | | | |
| Mahmood et al. (2023) | 17 MENA (2000-2019) | Spatial model | NR↑$CO_2$ |
| Yu-Ke et al. (2022) | G-20 (1995-2018) | PMG | NR↑$CO_2$ |
| Agboola et al. (2021) | KSA (1971-2016) | T-Y | NR↑$CO_2$ |
| Mehmood and Tariq (2020) | Sou. Asian (1972-2013) | FE, DOLS | NR↑$CO_2$ |
| Globalization | | | |
| Altaee (2023) | Iraq (1990-2020) | ARDL, FMOLS | GLOB↓$CO_2$ |
| Okere et al. (2023) | Nigeria (1971-2017) | ARDL | GLOB↓$CO_2$ |
| Ucan et al. (2023) | BRICS (1992-2015) | CCEMG | GLOB↓$CO_2$ |
| Altaee and Azeez (2023) | 10 emmeters (1997 2019 | PCSE, D-L | GLOB↓GHG |
| Xu and Hussain (2023) | MENA (1995-2018) | GMM, D-K | GLOB↑$CO_2$ |
| Mahmood et al. (2023) | S.Asian (1972-2013) | ARDL | GLOB↑$CO_2$ |
| Industrialization | | | |
| Xu and Hussain (2023) | MENA (1995-2018) | GMM, D-K | IND↑$CO_2$ |
| Ahmed et al. (2022) | Asia Pacific (1995-2020) | ARDL | IND↑$CO_2$ |
| Sikder et al. (2022) | Dev. Count. (1995-2018) | FMOLS | IND↑$CO_2$ |
| Zafar et al. (2020) | 46 Asian count. (1991-2017) | FMOLS | IND↑$CO_2$ |
| Al-Mulali and Ozturk (2015) | 14 MENA (1996-2012) | FMOLS | IND↑FP |

VECM: Vector error correction model, ARDL: Autoregression distributive lag model, NARDL: Nonlinear autoregression distributive lag, PMG: Pooled mean group, GMM: Generalized method of moments, FMOLS: Fully modified ordinary least squares, DOLS: Dynamic ordinary least squares, FEM: Fixed effects model, RFM: Random effects model, NR: Natural resources rent, GLOB: Globalization, PS: Political stability, EKC: Environmental kuznets curve, T-Y: Toda-Yamamoto, CCEMG: Common correlated effect mean group, D-K: Driscoll-Kraay, ↑: Increase, ↓: Decrease, CCE: Central and eastern europe, Footprint; Dev. count. Developing countries, SSA: Sub-Saharan Africa, FP: Footprint, Env: Environment, S. Asian: South Asian countries, IND: Industralisation

tackles a range of obstacles, such as concerns related to serial correlation bias, heteroskedasticity, and endogeneity.

The following sections are organised as follows: The "Literature Review" provides a comprehensive examination of relevant works that explore the implications of political stability, together with other variables, within a broader framework. The section labeled "Data, Model, and Methodology" thoroughly explains this studys dataset, model framework, and methodological approach. The subsequent section, Results and Discussion, covers the empirical findings and their comprehensive analysis. In conclusion, the section titled "Conclusions and Policy Implications" comprehensively analyzes the studys results and their potential impact on policy decisions.

## 2. LITERATURE REVIEW

Numerous empirical research has examined the relationship between political stability and environmental quality, although the evidence needs to be more conclusive, particularly in emerging nations. Table 1 listed number of related studies.

The outcome of previous studies clearly point toward the existence of Environmental Kuznets Curves (EKC) in all the reviewed studies. However, the influence of political stability on $CO_2$ emissions remains uncertain, while industrialization appears to have a negative impact on environmental quality. The effects of globalization also lack clarity.

## 3. DATA, MODEL, ESTIMATION METHODS

### 3.1. Data

This study aims to investigate the impact of political stability, economic growth, industrialization, globalization, and natural resources rent, on carbon dioxide emission within the context of ANRAC. Table 2 presents the measurements of the variables incorporated in our panel, together with the corresponding units of measurement, and provides the sources of all the data utilized for the econometric calculation. The series included in the analysis consists of yearly observations from 1996 to 2019 and were chosen based on data availability.

Data are collected from the World Development Indicators (WDI, 2022), KOF Swiss Economic Institute, and OECD. Stats. Our dataset consists of Top 20 greenhouse gas emitter Countries, namely Argentina, Australia, Brazil, Canada, China, France, Germany, India, Iran, Islamic Rep., Italy, Japan, Korea, Rep., Mexico, Poland, Russian Federation, Saudi Arabia, South Africa, Turkey, United Kingdom, United States. To this end, this study used annual data stretching from 1997 to 2019. Details of variables

**Table 2: List of variables, descriptions, and data sources**

| Variable | Definition | Data sources |
|---|---|---|
| $LnCO_2$ | $CO_2$ emissions (metric tons per capita) | WDI |
| *LnGDP* | GDP per capita (constant 2015 price US$) | FAOSTAT |
| *PS* | Political stability | WGI |
| *LnNR* | Natural resource rent (% of GDP) | WDI |
| *LnGLOB* | Globalization | KOF |
| *LnIND* | Industry (including construction), value added (% of GDP) | FAOSTAT |
| *GDPPS* | Interaction of *GDP* with *PS* | Calculated |

WDI: World development indicators, KOF: Swiss economic institute, and WGI: World governance indicators, FAOSTAT: Food and agriculture

are reported in Table 2. Descriptive statistics are presented in Table 2.

Regarding the evaluation of the Globalization Index, it functions as a comprehensive composite measure that evaluates the political, economic, and social dimensions of globalization. The index mentioned above is pivotal in monitoring the progression of globalization levels across nations over a prolonged duration. The KOF Globalization Index, initially formulated by Dreher (2006) and then revised in 2008, is widely acknowledged as the primary framework for assessing globalization. The index in question has been calculated yearly, spanning from 1970 to 2019, by Gygli et al. (2019).

Political factors are computed from the World Banks worldwide governance indicators (WGI) project. This metric incorporates six governance characteristics, specifically Political Stability and Absence of Violence/Terrorism. The WGI metrics utilise a wide range of individual underlying factors that have been collected from various data sources (Kaufmann et al., 2010).

### 3.2. Model

We present the proposed framework in the equation to examine the impacts of political stability, economic growth, industrialization, globalization, and natural resource rents on environmental degradation within the ANRAC context (1):

$$(CO_2)_{it} = f\,(GDP_{it}, PS_{it}, NR_{it}, GLOB_{it}, IND_{it}, GDPPS_{it}) \quad (1)$$

Following the transformation of the model denoted by equation (1) into its stochastic linear form, the resulting model is as follows:

$$(LnCO_2)_{it} = \alpha + \varphi_1 LnGDP_{it} + \varphi_2 PS_{it} + \varphi_3 LnNR_{it} + \varphi_4 LnGLOB_{it} + \varphi_5 LnIND_{it} + \varphi_6 GDPPS_{it} + u_{it} \quad (2)$$

Here, t is the time period between 1996 and 2019, and i stands for a specific country in the panel. uit represents the residual term and $\alpha$ is constant. The long-term coefficients for the explanatory variables were $\varphi_1 \dots \varphi_6$ respectively. Finally, the error term $u_{it}$ was assumed to be identically distributed.

Regarding the anticipated indications of the independent variables in the equation for carbon emissions, it is well accepted that heightened production activity levels are generally linked to environmental deterioration, resulting in augmented energy usage.

The influence of political stability on environmental quality can be observed in various ways. The presence of political stability in a given environment has the potential to enhance the process of policy formulation, enable effective long-term planning, and encourage investments in sustainable technologies and practises. This, in turn, can lead to an increase in the adoption of clean energy consumption, directly contributing to sustainable economic growth and improved environmental quality (Sohail et al., 2022).

On the other hand, it is worth noting that political instability has the potential to impede the implementation of effective environmental laws. This can lead to the establishment of inconsistent regulations and act as a deterrent for both foreign direct investment (FDI) and domestic investors. Consequently, these factors may contribute to an increase in $CO_2$ emissions. Moreover, Sui et al. (2021) provide evidence that an enhancement in political stability within a particular country might positively impact neighbouring countries environmental quality through political stability spill-overs.

Ample natural resources, such as oil, can significantly influence $CO_2$ emissions in diverse ways. An abundance of these resources, particularly oil, frequently leads to heightened energy output and consumption. Given that fossil fuels, such as oil, function as a predominant source of energy and are employed more extensively during periods of abundance, this utilisation results in increased $CO_2$ emissions stemming from their combustion. In summary, abundant natural resources have the potential to stimulate economic expansion; yet, it can also lead to heightened carbon dioxide emissions due to escalated energy usage, greater dependence on fossil fuels, and a shortage of economic diversification. Acknowledging and tackling these problems is imperative to effectively reduce the environmental consequences in resource-abundant areas like the ANRAC.

Globalization refers to the process of moving away from economic self-sufficiency and isolation towards further integration into the global economic system, as emphasised by scholars such as Hill and Rapp (2009), Adebayo and Acheampong (2022), and He et al. (2021). The phenomenon of globalization can yield environmental advantages through the attraction of foreign direct investment (FDI) and the facilitation of the optimal and productive utilisation of resources.

The United Nations Economic and Social Commission for Western Asia (ESCWA, 2020) has reported that Arab states are undergoing a process of fast urbanization and industrialization, resulting in the loss of natural resources and environmental deterioration. Promoting industrialization in many Arab countries is still characterized by policies that deviate from sustainability principles, resulting in the establishment of highly polluting industries, including mining, iron and steel production, and heavy chemicals manufacturing.

The interaction term GDPPS demonstrates the combined impact of economic growth, as measured by GDP per capita, and political stability on carbon emissions. If the coefficient ($\varphi_6$) is negative, it can be inferred that political stability decreases in $CO_2$ emissions by promoting economic development. The basis for our hypothesis is rooted in the observed positive relationship between increasing personal incomes, which may be attributed to economic progress, and the ability of individuals to develop a greater awareness and concern for the environment. Nevertheless, it is crucial to acknowledge that the potential influence of economic growth in mediating the association between political stability and $CO_2$ emissions is not inherently assured. The extent governments prioritize and manage their economic growth determines the outcome. Implementing policies, laws, and incentives is crucial role in guaranteeing the harmonization of economic growth with environmental sustainability and mitigating $CO_2$ emissions.

### 3.3. Estimation Methods

The baseline estimation method will be selected based on the normalcy tests results. The quantiles regression approach will be employed when the variables contained in the panel data do not adhere to a normal distribution Al-Jafari and Altaee (2023); Altaee and Saya (2023). This study utilizes the unique moment-of-moments quantile regression (MMQREG) approach, as Machado and Santos Silva (2019) suggested.

To enhance the reliability of our findings and evaluate the consistency of the results, we utilize various supplementary methodologies such as generalized least squares (GLS), the linear regression model with panel-corrected standard errors (PCSE), and the heterogeneous fully modified ordinary least squares (FMOLS) approach. Notably, the PCSE, GLS, and FMOLS approach uniquely apply to the conditional mean of the dependent variable.

## 4. STATISTICAL ANALYSIS: DESCRIPTIVE STATISTICS AND DATA PROPERTY TESTING

### 4.1. Descriptive Statistics

This study utilizes descriptive statistics to summarize the data before empirical estimation. This section analyzes various statistical aspects of each variable, including their mean, maximum, minimum, and the total number of observations represented by the maximum value. Additionally, kurtosis and skewness are employed to assess the datas normality. To evaluate normality, we used the Jarque and Bera (1987) (JB) test and the Shapiro-Wilk (Shapiro and Wilk, 1965) test.

Summary statistics for the panel variables are presented in the upper panel of Table 3. The results indicate that all of the variables exhibit negative skewness. Furthermore, both natural resources and globalization exhibit kurtosis values >3. Both normality tests yield similar results, suggesting non-normal distributions for these variables.

Moreover, results indicate no outliers in the panel variables, and the correlation coefficients between the independent variables are all lower than 0.8. This may be an indication that there is no multicollinearity among independent variables.

In addition, the correlation between economic growth and per capita $CO_2$ emissions is the highest, the PS variable have the second highest correlation with $CO_2$, which preliminarily supports the role that political stability can play in economic development demonstrating that the good performance of the economy will stimulate carbon emissions.

Ignoring the violation of the normality assumption of errors is a common mistake that can lead to inconsistencies in the results, as it is an underlying assumption for many statistical procedures, such as t-tests and linear regression analysis. To avoid this, normality tests such as the Shapiro-Wilk test can be used to verify whether this assumption is met or violated.

A Shapiro-Wilk test, as displayed in Table 4, indicated that the test scores were not normally distributed, with W values ranging from 0.856 to 0.976. This deviation from normal distribution is statistically significant at the 1% significance level.

### 4.2. Cross-Sectional Dependence Test

The imperial investigation introduces the cross-sectional

**Table 3: Description statistics of variables and correlation coefficients**

| Statistics | $LnCO_2$ | LnGDP | PS | LnNR | LLnGLOB | LnIND | GDPPS |
|---|---|---|---|---|---|---|---|
| Mean | 2.191 | 9.377 | −0.349 | 3.015 | 4.095 | 2.257 | −2.375 |
| Median | 2.626 | 9.793 | −0.220 | 3.197 | 4.131 | 2.270 | −2.150 |
| Maximum | 3.864 | 11.205 | 1.224 | 4.179 | 4.334 | 2.897 | 13.700 |
| Minimum | 0.411 | 7.668 | −3.180 | 0.595 | 3.622 | 0.684 | −25.786 |
| Std. Dev. | 1.129 | 1.191 | 1.028 | 0.843 | 0.166 | 0.532 | 9.284 |
| Skewness | −0.134 | −0.014 | −0.464 | −1.045 | −1.078 | −0.779 | −0.199 |
| Kurtosis | 1.321 | 1.357 | 2.425 | 3.343 | 3.441 | 2.876 | 2.262 |
| J-Bera | 26.008 | 24.289 | 10.717 | 40.374 | 43.568 | 21.998 | 6.326 |
| Robability | 0.000 | 0.000 | 0.005 | 0.000 | 0.000 | 0.000 | 0.042 |
| Correlation analysis | | | | | | | |
| Variable | $LCO_2$ | LGDP | PS | LNR | LGLOB | LIND | |
| $LnCO_2$ | 1.0000 | | | | | | |
| LnGDP | 0.9809 | 1.0000 | | | | | |
| PS | 0.6681 | 0.7335 | 1.0000 | | | | |
| LnNR | 0.5261 | 0.4607 | −0.0344 | 1.0000 | | | |
| LnGLOB | 0.4298 | 0.5075 | 0.6561 | −0.2768 | 1.0000 | | |
| LnIND | 0.0964 | 0.0981 | 0.4317 | −0.5425 | 0.5800 | 1.0000 | |

dependence (CSD) test in the N-9 and T = 19 macro panel data. A CSD test notifies one about any dependence among the countries. The outcome of ignoring this interdependence is misleading inferences, as standard panel data models assume independence, which might not hold when dealing with similar countries sharing specific characteristics, for instance, the size of the economy, the depend on oil to differing degrees, tradition, and religion.

Accordingly, the investigation of cross-sectional dependence has recently assumed a prominent role in econometric research. This work continues with the application of the four most common tests of CED, Breusch and Pagan (1980) LM, Pesaran (2004) scaled LM, Baltagi et al. (2012) bias-corrected scaled LM, and Pesaran (2004) CED.

Table 5 shows the findings of the four CSD tests, which demonstrate, according to the Breusch-Pagan LM test the occurrence of CSD in the panel data of carbon emissions, growth rate, natural resource rent, industrialization, political stability, and the interaction term. In addition to the Breusch-Pagan LM test, the Pesaran CSD test, which has good properties for the panels with both small cross-sections and time, shows similar results at the 5% significance level for all variables but carbon emission. This means that a single macroeconomic disruption shock in one country will disrupt the other countries data.

### 4.3. Slope Homogeneity Test

To avoid assuming that the regression parameters are identical for each individual cross-sectional unit, we investigate the panels slope homogeneity property. By assessing this property, we can determine whether the slopes of the regression lines are consistent across different units within the panel dataset.

We employ tests developed by Pesaran and Yamagata (2008) to test the homogeneity of pitches. The null hypothesis of this test assumes slope homogenous coefficients. Table 6 illustrates the results of and adj, and both statistics are statically significant at the 1% significant level. As a result, one can conclude that the panel models are not homogenous.

### 4.4. Results of CIPS Second Generation Test

The importance of using second-generation unit root tests lies in its ability ability to address CSD in panel data, resulting in more accurate and reliable inference (Pesaran, 2007).

The results in Table 7 indicate that all observed variables are non-stationary at the I(0) level. This suggests the presence of a unit root in the study variables. However, all the variables exhibit statistically significant estimates at I(1), with significance levels at 1%.

This indicates the absence of a unit root for the variables, both in terms of the intercept and intercept and trend. The availability of stationary data allows the current study to empirically investigate the cointegration among these variables.

### 4.5. Outcomes of Pedroni and Kao Tests of Cointegration

Table 8 summarizes the cointegration results according to the Pedroni and Kao tests. The presence of cointegration in the model is determined by the statistical significance of the test statistics. Consequently, it is established that $CO_2$ emissions have long-run associations with all regressors.

## 5. ESTIMATION RESULTS

This study utilizes the MMQREG method to estimate parameters across the complete conditional distribution of $CO_2$ emissions to examine the relationship between political stability, economic growth natural resource rents, globalization, industrialization, and the interaction of gross domestic product with political stability

**Table 4: Shapiro-Wilk W test for normalcy of the variables**

| Variable | Obs | W | V | Z | Prob>z |
|---|---|---|---|---|---|
| *LnCO₂* | 216 | 0.856 | 22.955 | 7.238º | 0.000 |
| *LnGDP* | 216 | 0.863 | 21.865 | 7.125º | 0.000 |
| *PS* | 216 | 0.962 | 6.085 | 4.171º | 0.000 |
| *LnNR* | 216 | 0.89 | 17.565 | 6.620º | 0.000 |
| *LnGLOB* | 216 | 0.899 | 16.139 | 6.424º | 0.000 |
| *LnIND* | 216 | 0.909 | 14.597 | 6.192º | 0.000 |
| *GDPPS* | 216 | 0.976 | 3.788 | 3.077º | 0.001 |

º, depict significance level of 1%

**Table 5: CSD tests**

| Variable | Breusch-Pagan LM | Pesaran scaled LM | Bias-corrected scaled LM | Pesaran CD |
|---|---|---|---|---|
| *LnCO₂* | 328.7*** | 34.5*** | 34.3*** | 1.5 |
| P-value | 0.000 | 0.000 | 0.000 | −0.001 |
| *LnGDPpc* | 395.4*** | 42.4*** | 42.2*** | 7.7*** |
| P-value | 0.000 | 0.000 | 0.000 | 0.000 |
| *LnNR* | 525.1*** | 57.6*** | 57.4*** | 22.5*** |
| P-value | 0.000 | 0.000 | 0.000 | 0.000 |
| *LnIND* | 358.5*** | 26.2*** | 26.9*** | 2.5** |
| P-value | 0.000 | 0.000 | 0.000 | 0.000 |
| *LnGLOB* | 700.8*** | 78.4*** | 78.2*** | 26.3*** |
| P-value | 0.000 | 0.000 | 0.000 | 0.000 |
| *POLSTAB* | 238.5*** | 23.9*** | 23.7*** | 6.8*** |
| P-value | 0.000 | 0.000 | 0.000 | 0.000 |
| *GDP*PS* | 250.7*** | 25.3*** | 25.1*** | 7.0*** |
| P-value | 0.000 | 0.000 | 0.000 | 0.000 |

***depict significance level of 1%. CSD: Cross-sectional dependence

**Table 6: Slope homogeneity tests**

| Slope heterogeneity test | Statistics | P-value |
|---|---|---|
| $\tilde{\Delta}$ | 10.198*** | 0.000 |
| $\tilde{\Delta}$adj | 12.49*** | 0.000 |

***depict significance level of 1%

**Table 7: Second generation stationary test (CIPS) for panel variables**

| Variable | Intercept | P-value | Intercept and trend | P-value |
|---|---|---|---|---|
| $LnCO_2$ | −1.656 | ≥0.10 | −2.082 | ≥0.10 |
| $\Delta LnCO_2$ | −3.914 | <0.01 | −4.317 | <0.01 |
| *LnGDP* | −1.673 | ≥0.10 | −1.427 | ≥0.10 |
| *ΔLnGDP* | −3.26 | <0.01 | −3.498 | <0.01 |
| *PS* | −2.288 | <0.10 | −2.11 | ≥0.10 |
| *Δ PS* | −4.403 | <0.01 | −4.389 | <0.01 |
| *LnNR* | −1.537 | ≥0.10 | −1.803 | ≥0.10 |
| *ΔLnNR* | −3.971 | <0.01 | −4.013 | <0.01 |
| *LnGLOB* | −2.157 | <0.10 | −2.34 | <0.10 |
| *ΔLnGLOB* | −4.41 | <0.01 | −4.548 | <0.01 |
| *LnIND* | −1.898 | ≥0.10 | −1.994 | ≥0.10 |
| *ΔLnIND* | −4.007 | <0.01 | −4.247 | <0.01 |
| *GDPPS* | −2.27 | <0.10 | −2.13 | ≥0.10 |
| *ΔGDPPS* | −4.44 | <0.01 | −4.413 | <0.01 |

**Table 8: Panel cointegration tests**

| Test | Statistic | Value | Sig. |
|---|---|---|---|
| Pedroni | Modified Phillips-Perron t | $3.013^{\odot}$ | 0.001 |
| | Phillips-Perron t | $-1.756^{ʒ}$ | 0.040 |
| | Augmented Dickey-Fuller t | $-2.382^{\odot}$ | 0.009 |
| Kao | Modified Dickey-Fuller t | $-4.861^{\odot}$ | 0.000 |
| | Dickey-Fuller f | $-4.735^{\odot}$ | 0.000 |
| | Augmented Dickey-Fuller t | $-3.212^{\odot}$ | 0.001 |
| | Unadjusted modified Dickey-Fuller t | $-4.013^{\odot}$ | 0.000 |
| | Unadjusted Dickey-Fuller t | $-4.555^{\odot}$ | 0.000 |

Pedroni test include time trend; $^{\odot}$ depict significance level of 1%, and $^{ʒ}$ depict the 5% level

on $CO_2$ emissions within ANRAC. It is worth mentioning that this approach does not necessitate any assumptions about the distribution of the target variable. This is particularly relevant given that the results of the Jarque-Bera (J-B) and Shapiro-Wilk normality tests have previously indicated a violation of this condition. This is of great importance for policymaking as it enables the classification of ANRAC countries based on their varying levels of $CO_2$ emissions, namely into categories of low, intermediate, and high emissions.

The estimations shown in Table 9 demonstrate a positive correlation between GDP and $CO_2$ emissions, as observed by the MMQREG model. The empirical findings indicate that a 1% increase in economic growth is associated with an average increase of 0.99% in per capita $CO_2$ emissions.

The presence of a positive coefficient for GDP suggests that there is a detrimental impact on environmental sustainability as a result of increased $CO_2$ emissions. This finding aligns with the results reported by Farooq et al. (2023) in the context of the Gulf Cooperation Council countries (GCC), Agboola et al. (2021) and Sharmin and Tareque (2020) in the case of four chosen developing Asian economies, Mahmood et al. (2020) about Saudi Arabia, and Ganda (2018) concerning South Africa. However, the results shown here contrast the conclusions Hamdan (2023) reported in the context of the United Arab Emirates. Hamdans study did not identify a statistically significant association between $CO_2$ emissions and GDP increase.

These results indicate that the economic activity in the economies of Arab oil-rich countries is not environmentally sustainable. These economies prioritize generating higher revenue and fostering a superficial sense of luxury to achieve rapid economic growth, but this comes at the expense of environmental quality. This economic activity has increased energy consumption, environmental degradation, and gas flaring.

Political stability exerts a consistently negative and significant impact on environmental sustainability across all quantiles. This outcome can be attributed to the potential for politically stable governments to prioritize short-term natural resource exploitation over long-term sustainability. Furthermore, such governments may become more susceptible to the influence of powerful interest groups, particularly profit-driven corporations and industries, at the expense of environmental conservation. These interest groups can wield significant power over policy decisions, often at the expense of sustainability.

This result aligns with Kirikkaleli and Osmanli (2023) and Agheli and Taghvaee (2022). Nevertheless, our findings contrast with those of Mrabet et al. (2021), who suggest a positive impact of political stability on environmental quality in oil-rich MENA countries.

Concerning globalization, our results show that a 1% increase in globalization reduces $CO_2$ by 0.798% on average, which is statistically significant at a 1% level. The magnitude of impact and the significance level is noted to increase from lower (Q0.10) quantile(s) to upper (Q0.90) quantile(s). Several factors justify the favourable effect of globalization: First, as globalization continues to evolve, there is an increasing transfer of environment-friendly technologies across nations, particularly from developed to underdeveloped countries while polluting resources decrease (Ahmed et al., 2022). Another explanation is that there is a shift in comparative advantage towards economies, especially in developing countries without a climate policy. This conclusion aligns with previous studies, such as Adebayo and Acheampong (2022) and Balsalobre-Lorente et al. (2019). However, it is worth noting that the studies conducted by Adebayo et al. (2022) and Kostakis et al. (2023) contradict this finding.

The extensive utilization of natural resources, involving the incorporation of material inputs, leads to environmental repercussions due to resource extraction, processing, manufacturing, consumption, and waste disposal across all stages of a product or services life cycle. This can have detrimental effects on environmental sustainability. This concept is reflected in the positive sign of the coefficient associated with this variable.

The impact of industralization is positive and statistically significant for all the quantiles. Carbon emissions increase

**Table 9: Coefficient estimates of the panel quantile regressions**

AQ8

| ??? | *LnGDP* | *PS* | *LnNR* | *LnGLOB* | *LnIND* | *GDPPS* | *Intercept* |
|---|---|---|---|---|---|---|---|
| Location | 0.989*** | 0.706*** | 0.113*** | −0.798*** | 0.216*** | −0.086*** | −4.597*** |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Scale | 0.006 | 0.105 | 0.022 | -0.399*** | 0.051** | −0.009 | 1.522*** |
| | 0.636 | 0.235 | 0.101 | 0.000 | 0.021 | 0.365 | 0.000 |
| 0.1 | 0.979*** | 0.534*** | 0.077** | −0.146 | 0.132*** | −0.072*** | −7.086*** |
| | 0.000 | 0.008 | 0.011 | 0.462 | 0.009 | 0.001 | 0.000 |
| 0.2 | 0.982*** | 0.581*** | 0.087*** | −0.324* | 0.155*** | −0.076*** | −6.408*** |
| | 0.000 | 0.001 | 0.001 | 0.058 | 0.000 | 0.000 | 0.000 |
| 0.3 | 0.984*** | 0.626*** | 0.096*** | −0.494*** | 0.177*** | −0.079*** | −5.757*** |
| | 0.000 | 0.000 | 0.000 | 0.002 | 0.000 | 0.000 | 0.000 |
| 0.4 | 0.987*** | 0.673*** | 0.106*** | −0.674*** | 0.200*** | −0.083*** | −5.071*** |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0.5 | 0.989*** | 0.709*** | 0.114*** | −0.809*** | 0.217*** | −0.086*** | −4.555*** |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0.6 | 0.990*** | 0.739*** | 0.120*** | −0.924*** | 0.232*** | −0.089*** | −4.116*** |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0.7 | 0.992*** | 0.765*** | 0.125*** | −1.023*** | 0.245*** | −0.091*** | −3.740*** |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0.8 | 0.994*** | 0.810*** | 0.135*** | −1.192*** | 0.266*** | −0.095*** | −3.094*** |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 0.9 | 0.998*** | 0.869*** | 0.147*** | −1.416*** | 0.295*** | −0.099*** | −2.240*** |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 |

Numbers next to coefficient estimates are P-values. *Sig. at 10%. **Sig. level at 5%, and ***Sig at 1%

**Table 10: The outcomes of long-run estimators (FMOLS, PCSEs, and GLS)**

| Variable | FMOLS | PCSE | GLS |
|---|---|---|---|
| *$LnCO_2$* | 0.756568*** | 0.988608*** | 0.988608*** |
| | 2.06E-84 | 0.0000 | 0.0000 |
| *PS* | 0.164416*** | 0.705781*** | 0.705781*** |
| | 1.26E-41 | 0.0000 | 0.0000 |
| *LnNR* | 0.041279*** | 0.113045*** | 0.113045*** |
| | 0.009676 | 0.0000 | 0.0000 |
| *LnGLOB* | −0.21022*** | −0.79821*** | −0.79821*** |
| | 2.28E-06 | 0.0000 | 0.0000 |
| *LnIND* | 0.280985*** | 0.21583*** | 0.21583*** |
| | 6.10E-06 | 0.0000 | 0.0000 |
| *GDPPS* | −0.01823** | −0.08597*** | −0.08597*** |
| | 0.011372 | 0.0000 | 0.0000 |
| *Intercept* | | −4.59714*** | −4.59714*** |
| | | 0.0000 | 0.0000 |
| $R^2$ | 0.99355 | 0.9831 | |

Numbers next to coefficient estimates are P-values. **Sig. level at 5%, and ***Sig. level at 1%

significantly along with industrialization, and its contribution to environmental degradation is higher in the higher quantiles. Findings reveal that, at least a 0.21% increase in $CO_2$ emissions is associated with a 1% upsurge in the industrial value-added share in GDP in the lower part of $CO_2$ distribution. Moreover, the highest effect is in the upper quantiles. Such findings are consistent with the earlier findings of Quito et al. (2023) for 106 countries, Xu and Hussain (2023) for MENA countries, Ahmed et al. (2022) for 46 Asian countries and Sikder et al. (2022) for 23 developing countries.

The previous empirical analysis proved that per capita income, political stability, natural resources, and industrialization could increase $CO_2$ emissions. At the same time, globalization and the interaction term can help to decrease $CO_2$ emissions. In this section, we conducted robustness checks to authorize the consistency of the above results.

To achieve this aim we us three long run panel regression i.e., FMOLS, PCSEs, and GLS. The three models produced similar results to those obtained by the MMQREG, as shown in Table 10. This gives further support to the results obtained by the baseline model.

## 6. CONCLUSIONS AND POLICY IMPLICATIONS

This research investigates the impact of economic growth, political stability, globalization, industrialization, and natural resources rent on carbon emissions in nine Arab nations with abundant resources. The analysis covers the period from 1996 to 2019. The research in this study employed a generalized method of moments quantile regression (MMQREG) approach. Three long-term panel regressions were used to assess the durability of the initial findings.

Both the baseline approach and the models for robustness tests suggest that integrating environmental sustainability with globalization can enhance its enhancement. The presence of an interaction term demonstrates a beneficial influence on ecological sustainability. All of the remaining variables exhibit a high degree of statistical significance, indicating that these factors harm the ecosystem. It is imperative to acknowledge that although the correlation between economic growth and political stability may create favourable circumstances for enhancing environmental quality, it does not ensure such outcomes. The policies, priorities, and activities implemented by governments and industries significantly influence the consequences.

The ramifications of these findings are of significant importance for the economies included in our sample. The initial observation underscores that the beneficial effects of GDP, industrialization, and natural resources rent emphasize the lack of environmental sustainability in the GDP expansion of Arab resource countries. Policymakers must exercise constant vigilance about the ecological ramifications of structural transformations, the widespread utilization of natural resource-based industries, and the broader scope of economic advancement. Countries belonging to the ANRAC group have experienced substantial growth in their worldwide market presence within international trade. This underscores the necessity of considering the ecological consequences of these commercial activities in the area.

Given the studys outcomes, authorities must give precedence to sustainable development by adopting a well-rounded strategy that promotes economic advancement and safeguards the environment. To harness the beneficial environmental effects of globalization and address any downsides, the following solutions are proposed: The establishment of standardized and harmonized worldwide environmental standards and guidelines is of paramount importance. Additionally, it is imperative to prioritize facilitating the transfer of environmentally sustainable technologies from industrialized nations to the region.

Furthermore, ANRAC must undertake necessary measures to modify its industrial structure to diminish the sectors that contribute significantly to energy consumption continually.

## REFERENCES


Abid, M. (2016), Impact of economic, financial, and institutional factors on $CO_2$ emissions: Evidence from Sub-Saharan Africa economies. Utilities Policy, 41, 85-94.

Adebayo, T.S., Acheampong, A.O. (2022), Modelling the globalization-$CO_2$ emission nexus in Australia: Evidence from Quantile-On-Quantile approach. Environmental Science and Pollution Research, 29(7), 9867-9882.

Adebayo, T.S., Akadiri, S.S., Uhunamure, S.E., Altuntaş, M., Shale, K. (2022), Does political stability contribute to environmental sustainability? Evidence from the most politically stable economies. Heliyon, 8(12), e12479.

Agboola, M.O., Bekun, F.V., Joshua, U. (2021), Pathway to environmental sustainability: Nexus between economic growth, energy consumption, $CO_2$ emission, oil rent and total natural resources rent in Saudi Arabia, Resources Policy, 74, 102380.

Agheli, L., Taghvaee, V.M. (2022), Political stability effect on environment and weak sustainability in Asian countries. Sustainability Analytics and Modeling, 2, 100007.

Ahmed, F., Ali, I., Kousar, S., Ahmed, S. (2022), The environmental impact of industrialization and foreign direct investment: Empirical evidence From Asia-pacific region. Environmental Science and Pollution Research, 29(20), 29778-29792.

Al-Jafari, M.K., Altaee, H.H.A. (2023), The role of labor productivity in reducing carbon emission utilizing the method of moments quantile regression: Evidence from top 40 emitter countries. International Journal of Economics and Finance, 15(3), 1-12.

Al-Mulali, U., Ozturk, I. (2015), The effect of energy consumption, urbanization, trade openness, industrial output, and political stability on the environmental degradation in the MENA (Middle East and North African) region. Energy, 84, 382-389.

Al-Mulali, U., Weng-Wai, C., Sheau-Ting, L., Mohammed, A.H. (2015), Investigating the Environmental Kuznets Curve (EKC) hypothesis by utilizing the ecological footprint as an indicator of environmental degradation. Ecological Indicators, 48, 315-323.

Al-Shammari, A.M. (2016), Environmental pollutions associated to conflicts in Iraq and related health problems. Reviews on Environmental Health, 31(2), 245-250.

Altaee, H.H.A. (2023), An attempt to visualize the Iraqi Kuznets environmental curve 1990-2020: Do energy consumption and globalization matter? The Scientific Journal of Cihan University – Sulaimanyia, 7(2), 320-337.

Altaee, H.H.A., Saya, J.A. (2023), Impacts of environment-related technology, structural change, and globalization on greenhouse gas emissions: Evidence from top twenty emitter countries. International Journal of Energy Economics and Policy, 13(6), 690-697.

Baltagi, B.H., Feng, Q., Kao, C. (2012), A Lagrange multiplier test for cross-sectional dependence in a fixed effects panel data model. Journal of Econometrics, 170(1), 164-177.

Böhringer, C., Rutherford, T.F. (2010), The choice of emission trading versus carbon taxes under political uncertainty. Journal of Public Economics, 94(34), 281-290.

Breusch, T.S., Pagan, A.R. (1980), The Lagrange multiplier test and its application to model specification in econometrics. Review of Economic Studies, 47(1), 239-253.

Bunnag, T. (2023), Analyzing short-run and long-run causality relationship among $CO_2$ emission, energy consumption, GDP, square of GDP, and foreign direct investment in environmental Kuznets curve for Thailand. International Journal of Energy Economics and Policy, 13(2), 341-348.

Camara, M. (2023), How do natural resource abundance and agriculture affect economic growth in Guinea? International Journal of Economics and Financial Issues, 13(3), 109-116.

Collier, P., Hoeffler, A., Rohner, D. (2009), Beyond greed and grievance: Feasibility and civil war. Oxford Economic Papers, 61(1), 1-27.

Dreher, A. (2006), Does globalization affect growth? Evidence from a new index of globalization. Applied Economics, 38(10), 1091-1110.

ESCWA. (2020) Arab Sustainable Development Report 2020, Economic and Social Commission for Western Asia, United Nations, Beirut. Available from: http://www.unescwa.org/publications/asdr2020 [Last accessed on 2023 Sep 01].

Farooq, U., Tabash, M.I., Anagreh, S., Al-Rdayeh, M., Habib, S. (2023), Economic growth, foreign investment, tourism, and electricity production as determinants of environmental quality: Empirical evidence from GCC region. Environmental Science and Pollution Research, 30(16), 45768-45780.

Fathi, R.A., Matti, L.Y., Al-Salíh, S.H., Godbold, D. (2013), Environmental pollution by depleted uranium in Iraq with special reference to mosul and possible effects on cancer and birth defect rates. Medicine, Conflict and Survival, 29(1), 7-25.

Friedlingstein, P., Jones, M.W., OSullivan, M., Zeng, J. (2022), Global carbon budget 2021. Earth System Science Data, 14(4), 1917-2005.

Ganda, F. (2018), The relationship between energy consumption, trade, GDP (economic growth), population growth and carbon emissions: A recent evidence from south Africa. International Journal of Sustainable Economy, 10(2), 99-122.

Gygli, S., Haelg, F., Potrafke, N., Sturm, J.E. (2019), The KOF globalization index-revisited. Review of International Organizations, 14, 543-574.

Hamdan, A. (2023), Carbon dioxide emissions and the economic growth: Competitiveness and economic development view. Competitiveness Review. https://doi.org/10.1108/CR-04-2023-0087

He, K., Ramzan, M., Awosusi, A.A., Ahmed, Z., Ahmad, M., Altuntaş, M. (2021), Does globalization moderate the effect of economic complexity on $CO_2$ emissions? Evidence from the top 10 energy transition economies. Frontiers in Environmental Science, 9, 778088.

Hill, R.P., Rapp, J.M. (2009), Globalization and poverty: Oxymoron or new possibilities? Journal of Business Ethics, 85, 39-47.

Jarque, C.M., Bera, A.K. (1987), A test for normality of observations and regression residuals. International Statistical Review, 55(2), 163-172.

Kaufmann, D., Kraay, A., Mastruzzi, M. (2010), The Worldwide Governance Indicators: Methodology and Analytical Issues. World Bank Policy Research Working Paper, No. 5430. Available from: https://ssrn.com/abstract=1682130 [Last accessed on 2023 Sep 28].

Kirikkaleli, D., Osmanli, A. (2023), The impact of political stability on environmental quality in the long run: The case of Turkey. Sustainability, 15(11), 1-18.

Kostakis, I., Armaos, S., Abeliotis, K., Theodoropoulou, E. (2023), The investigation of EKC within $CO_2$ emissions framework: Empirical evidence from selected cross-correlated countries. Sustainability Analytics and Modeling, 3, 100015.

Kourgiotis, P. (2020), Moderate Islam made in the United Arab Emirates: Public diplomacy and the politics of containment. Religions, 11(1), 43.

Lynch, M. (2012), The Arab Uprising: The Unfinished Revolutions of the New Middle East. New York: Public Affairs.

Mabon, S. (2012), Kingdom in Crisis? The Arab spring and instability in Saudi Arabia. Contemporary Security Policy, 33(3), 530-553.

Mabon, S. (2019), Understanding the Iraq War: Culture, Power, and the Politics of Knowledge. United Kingdom: I.B. Tauris.

Machado, J.A.F., Santos Silva, J.M.C. (2019), Quantiles via moments. Journal of Econometrics, 213(1), 145-173.

Mahmood, H., Alkhateeb, T.T.Y., Furqan, M. (2020), Oil sector and $CO_2$ emissions in Saudi Arabia: Asymmetry analysis. Palgrave Communications, 6, 88.

Mahmood, H., Saqib, N., Adow, A.H., Abbas, M. (2023), Oil and natural gas rents and $CO_2$ emissions nexus in MENA: Spatial analysis. PeerJ 11, e15708.

Mehmood, U., Tariq, S. (2020), Globalization and $CO_2$ emissions nexus: Evidence from the EKC hypothesis in south Asian countries. Environmental Science and Pollution Research, 27(29), 37044-37056.

Mrabet, Z., Alsamara, M., Mimouni K., Mnasri, A. (2021), Can human development and political stability improve environmental quality? New evidence from the MENA region. Economic Modelling, 94, 28-44.

Mukhopadhyay, A., Al-Awadi, E., Quinn, M., Akber, A., Al-Senafy, M., Rashid, T. (2008), Ground water contamination in Kuwait resulting from the 1991 gulf war: A preliminary assessment. Ground Water Monitoring and Remediation, 28(2), 81-93.

Oates, W.E. (1985), Searching for leviathan: An empirical study. The American Economic Review, 75(4), 748-757.

Okere, K.I., Muoneke, O.B., Ogbulu, M.O., Ogbodo I. (2023), Environmental quality and financial development revisited in the case of Nigeria: A counter factual simulation approach. International Journal of Sustainable Economy, 15(3), 384-414.

Pesaran, M.H. (2004), General Diagnostic Tests for Cross Section Dependence in Panels, Cambridge Working Papers in Economics No. 435.

Pesaran, M.H. (2007), A simple panel unit root test in the presence of cross-section dependence. Journal of Applied Econometrics, 22(2), 265-312.

Pesaran, M.H., Yamagata, T. (2008), Testing slope homogeneity in large panels. Journal of Econometrics, 142(1), 50-93.

Przeworski, A., Alvarez, M., Cheibub, J.A., Limongi, F. (2020), Democracy and Development: Political Institutions and Well-Being in the World, 1950-1990. New York: Cambridge University Press.

Quito, B., Rama R.D., García, J.Á., Durán-Sánchez, A. (2023), Impacts of industrialization, renewable energy and urbanization on the global ecological footprint: A quantile regression approach. Business Strategy and the Environment, 32(4), 1529-1541.

Rockström, J., Steffen, W., Noone, K., Foley, J. (2009), A safe operating space for humanity. Nature, 461, 472-475.

Shapiro, S.S., Wilk, M.B. (1965), An analysis of variance test for normality. Biometrika, 52 (3/4), 591-611.

Sharmin, M., Tareque, M. (2020), Sustainable growth-environment nexus in the context of four developing Asian economies: A panel analysis. Managing Global Transitions, 18(3), 237-256.

Sikder, M., Wang, C., Yao, X., Dou, X. (2022), The integrated impact of GDP growth, industrialization, energy use, and urbanization on $CO_2$ emissions in developing countries: Evidence from the panel ARDL approach. Science of the Total Environment, 837, 155795.

Sirag, A., Talha, A.E. (2023), The GDP - $CO_2$ Emissions Nexus in Arab Countries. Economic Studies No. 116. United Arab Emirates: Arab Monetary Fund.

Sohail, M.T., Majeed, M.T., Shaikh, P.A., Andlib, Z. (2022), Environmental costs of political instability in Pakistan: Policy options for clean energy consumption and environment. Environmental Science and Pollution Research, 29(17), 25184-25193.

Sui, B., Chang, C.P., Chu, Y. (2021), Political stability: an impetus for spatial environmental spillovers. Environmental and Resource Economics, 79, 387-415.

Ucan, O., Ozturk, I., Turgut, E. (2023), Determinants of ecological footprint in BRICS countries: A panel data analysis. Environment, Development and Sustainability, 1-14.

World Bank. (2023), World Development Indicators (WDI). Available from: http://databank.worldbank.org [Last accessed on 2023 Aug 01].

Xu, D., Hussain, J. (2023), Globalization, institutions, and environmental quality in middle east and north African countries. Environmental Science and Pollution Research, 30(26), 68951-68968.

Yu-Ke, C., Awan, R.U., Aziz, B., Ahmad, I., Waseem, S. (2022), The relationship between energy consumption, natural resources, and carbon dioxide emission volatility: Empirics from G-20 economies. Environmental Science and Pollution Research, 29(17), 25408-25416.

Zafar, A., Ullah, S., Majeed, M.T., Yasmeen, R. (2020), Environmental pollution in Asian economies: Does the industralisation matter? OPEC Energy Review, 44(3), 227-248.