Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 8, No. 5, 2394-2406
2024
Publisher: Learning Gate
DOI: 10.55214/25768484.v8i5.2006

Impact of corruption on economic growth in the MENA region: An empirical analysis from 2000-2020

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Abstract: This paper examines the impact of corruption on the economic growth of the Middle East and North African (MENA) countries through a modified Cobb-Douglas production function augmented for various corruption indices. The primary objective is to compare different corruption measures, such as the Corruption Perception Index, the Control of Corruption indicator from Worldwide Governance Indicators, and a newly developed Customized Corruption Index for their impacts on economic output. Using the ARDL econometric analysis, this paper gauges the effects of corruption on GDP growth in the MENA region, using data from the World Bank and Transparency International between 2000 and 2020. Results indicated that corruption does deter economic growth significantly, though at varying variables of corruption indices. These findings give reason to emphasize how important the accuracy of corruption measurement is in economic analysis, in contrast, decreased corruption may prove to be, in fact, the real driver of economic improvement in the MENA region. The paper contributes to the literature by underlining the economic costs of corruption and, based on evidence, makes some recommendations for policymakers seeking to foster economic development through better governance.

Keywords: *Cobb-douglas production function, Corruption, Customized corruption index (CCI), Econometric analysis, Economic growth, MENA region.*
JEL Classification: *O53; O43; D73; C32.*

1. Introduction

Corruption, to many, is considered one of the major deterrents to economic development and good governance. This would cause distortion in public policy because of misallocation of resources, reduce innovation, and perpetuate inefficiency, thus securing a vicious circle of negative trajectory in the level of economic progress. While corruption is a worldwide scourge, its pervasiveness and threat are certainly serious in the MENA region. The levels of corruption in MENA are related directly to less economic growth and chronic political instability, not unlike those witnessed in sub-Saharan Africa alone, often standing in the way of development projects (Ben Ali & Sassi, 2023).

As hard as international and local efforts might still be pursued against corruption, it remains extensively entrenched in the MENA region, with devastating economic consequences attached. Traditional corruption measures, such as the Corruption Perceptions Index and the Control of Corruption metric from the Worldwide Governance Indicators, are useful but incomplete proxies because they do not fully capture how corruption shapes economic growth (Aziz & Chowdhury, 2022). This limitation is a call to action for research that deploys these traditional measures while investigating the promise of more sophisticated and more region-specific tools in measuring the economic effects of corruption.

The paper tries to fill this lacuna by investigating the corruption-economic growth nexus in the MENA countries by using sound econometrics. The objectives of the paper are threefold: first, to investigate this relationship by using the traditional indices of CPI and WGI; second, to construct and

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validate a region-specific corruption index for the MENA region that may capture the influence of corruption on economic performance more accurately; and third, to juxtapose the relative strengths of traditional and customized indices in terms of explaining variation in economic growth within the region.

The meaning of this study goes beyond mere academic interest to one that makes serious empirical contributions. With an explanation of the implications of the revised econometric models and both the classical and novel corruption metrics, this study will be able to relate to effective policy interventions. The results will give policymakers a sound mathematical basis for designing anti-corruption policies that promote stability and economic growth. Furthermore, the development of a corruption index for the MENA region will provide significant depth to policy debates at the local level and be a useful benchmark for related studies and policy-making within similar economic and political contexts around the world.

2. Literature Review

2.1. Theoretical Background

Corruption and economic growth are theoretical concepts that have been evaluated in a very wide sense within the literature of economics, where the majority of scholars reach a consensus that corruption inhibits efficiency and economic growth. Theoretical models consider corrupt practices as an infringement upon market mechanisms and governmental functions, eventually yielding inefficient resource allocation, reduced investment, and slower economic growth as a consequence. Traditional economic models hold that corruption raises the cost of transaction by introducing uncertainty into the market and, in that process, discourages local and foreign investment. This more often than not leads to rent-seeking behavior, wherein resources are dissipated in pursuit of economic rents from the government rather than being put into productive activities in such a way as to reduce overall economic welfare.

The new growth theory goes ahead and incorporates corruption into its model, stating that corruption reduces incentives to innovate and accumulate capital. Corruption diverts public funds meant for essential service provision and infrastructure development, hence leading to non-optimal economic performance (Swaleheen, 2011; Dridi, 2022). Although the "grease the wheels" hypothesis does advance that corruption may speed up processes through systems afflicted by overly high bureaucracy, little evidence supporting this from empirical studies has emerged, and such findings have often been contradicted by other studies showing that any such gains within a short-run framework are outweighed by the damage done within a long-run economic context (Gyimah-Brempong & de Camacho, 2006; Haque, Kneller, & Dickson, 2021).

2.2. Previous Studies

Empirical research on the corruption-growth nexus has so far employed different methodologies, ranging from cross-country regressions through case studies to panel data analysis. Mauro's seminal study (1995) showed that higher levels of corruption coincide with lower investment rates and a slowdown in GDP growth. These findings were widely supported by further studies. For example, Mo (2001) corroborated the fact that corruption significantly retards economic growth by lowering the productivity of capital investments.

Encouraged by these findings, other studies attempted to investigate the channels of influence of corruption on growth. Swaleheen (2011), for example, was able to show, using panel data analysis, that corruption lowers economic growth by reducing both physical and human capital accumulation. Gyimah-Brempong and de Camacho (2006), amongst others, further added to this strand of literature by showing, through dynamic panel data models, that corruption is especially destructive when political and civil liberties are low. More recent studies, such as those by Saha and Gounder (2022) and Kutan, Planchon, and Nair-Reichert (2023), indeed underlined how important the quality of institutions and governance is in light of moderating influences stemming from corruption on growth.

Estimates of the effect on growth do, however, vary because of the difference in economic, cultural, and institutional contexts among countries. Some studies indicate that the consequences of corruption

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 8, No. 5: 2394-2406, 2024
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could be less serious in those countries where institutions and the rule of law are very strong (Treisman, 2000; Glaeser & Saks, 2020). This variation brings out the complexity in the relationship between corruption and growth, aside from calling for attention to regional and institutional differences in analysis.

2.3. Gap Identification

While there is a substantial volume of literature on how corruption reduces economic growth, several gaps remain, particularly for region-specific studies. Most of the available studies are cross-country analyses in nature that fail to consider nuances of various regions; MENA is one such corrupt-dominated region along with unique socio-economic and political contexts. Second, there is also no consensus on what corruption index does the job of capturing the proper level of corruption and its eventual impact on economic consequences. Most of the available studies use perceptual measures of corruption, such as the CPI and WGI, which may not reflect actual corrupt activities.

This present study fills these lacunae by investigating the relatively understudied MENA region, whose high corruption levels merit limited scholarly attention. This paper will, therefore, attempt to add new light to this trend of growing corruption by constructing and making use of a Customized Corruption Index fitting for the MENA region. In that sense, it attempts to provide a more accurate measurement of corruption by considering factors germane to the region and its actual incidents, as opposed to perceptions. The results are expected to give clearer insights into how corruption influences economic growth in the MENA region and lead to more specific policy recommendations for these countries.

This literature review therefore provides the background for an in-depth analysis of the direct impact of corruption on economic growth in the MENA region, a study that builds on prior theoretical and empirical research while responding to considerable lacunas in the existing literature.

3. Methodology

3.1. Description of Data

This paper utilizes a panel dataset from the period 2000-2020 to analyze the influence of corruption on the economic growth of the MENA region. The selected period will be an appropriate time to capture the significant economic and political events that the MENA region has gone through-especially the recent episode of the Arab Spring and the succeeding reforms-thus serving as a strong backdrop in understanding the long-run trends and dynamic, evolving nature of corruption and economic growth.

Its bases are drawn from various main sources, therefore giving an all-rounded and very accurate analysis. The WDI from the World Bank provides the needed variables on the macroeconomic level of GDP growth rates, gross capital formation, and government expenditure that are crucial in modeling the study of economic growth. The Corruption Perceptions Index by Transparency International provides the annual perceived levels of public sector corruption, hence enabling comparisons across countries over time. Transparency International 2020 gives the specific annual assessments needed. In addition, WGI provides aggregate governance data including the Control of Corruption indicator which reflects perceptions of the extent to which public power is exercised for private gain, Kaufmann, Kraay, & Mastruzzi (2022) have presented this particular indicator in their paper.

The collection of additional data from sources specific to each region allowed further refinement of the analysis. The surveys carried out by Arab Barometer in 2021, offer data on public opinion regarding governance, institutional trust, and perceptions of corruption to further contextualize the phenomenon of corruption in MENA societies. Additional data were sourced from the CCI through regional anti-corruption agencies, which provided reports and statistics on documented cases of corruption and enforcement actions within MENA countries. Investigative journalism outlets, like Al-Monitor, provided detailed accounts of corruption scandals and systemic issues (Hassan & Ferwana, 2023). Recently, a spurt in academic studies on corruption and governance in certain contexts within the MENA region saw to it that the CCI offers, at best, a minute step toward completeness of the data gathered. This is because the CCI, through this, captures perceived and actual instances of corruption,

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region-specific nuances accounted for, and thus a measure more apt for in-depth research analysis (Fayad, 2023).

3.2. Model Description

This paper investigates the impact of corruption on economic growth by utilizing an augmented Cobb-Douglas production function. The classic Cobb-Douglas function can be expressed in the following general form: $Y=A\cdot K\alpha\cdot L\beta$, where Y represents total economic output (GDP), A is total factor productivity, K is capital input, L is labor input, and α and β are the output elasticities of capital and labor, respectively, is modified to include corruption as an additional explanatory variable. In this augmented model, corruption is incorporated as an additional variable, transforming the function into $Y=A\cdot K\alpha\cdot L\beta$, where C represents the corruption indicator (CPI, WGI, or CCI), and γ is the output elasticity of corruption, which is expected to be negative, reflecting corruption's detrimental impact on growth as suggested by Jafarov & Gunnarsson, 2020.

This augmented model has been chosen for several reasons. First and foremost, flexibility-the Cobb-Douglas production function allows one to estimate the marginal impacts of corruption besides the conventional growth inputs as suggested by Shahab & Qayyum (2021). Besides that, this model provides comparability with past research using such frameworks, ensuring continuity and the ability to validate findings. In addition, due to the flexibility of this model, several measures of corruption were included in the analysis, allowing for an investigation and comparison of their various effects. Hence, as advanced by Ben Ali & Sassi (2023), it can be applied appropriately.

3.3. Statistical Methods

Different advanced econometric approaches demonstrate the possible relationship between corruption and economic growth in the current study. First, panel data regression is used to regress the data with both cross-sectional variations between different countries and temporal variations of the years under study. The general form of the regression model is given as follows:

$\text{Ln}\ (Yit)=\beta 0+\beta 1\ln(Kit)+\beta 2\ln(Lit)+\beta 3\ln(Cit)+\mu i+\lambda t+\epsilon it$, where i represents the country, t represents the year, μi captures country-specific effects, λt captures time-specific effects, and ϵit is the error term. Both Fixed Effects (FE) and Random Effects (RE) models are estimated, with the Hausman test employed to determine the appropriate specification (Greene, 2021).

It incorporates GMM estimators and, more precisely, the GMM estimator developed by Arellano-Bond to control for potential endogeneity and dynamic relationships. This method controls for unobserved heterogeneity and endogeneity effectively through the use of lagged variables as instruments. Consequently, it solves problems that will somehow show either a reverse causality between corruption and economic growth or omitted variable bias.

Several diagnostic tests have been done to ensure the validity and reliability of results. In this respect, multicollinearity has been tested using the VIF, to make sure that independent variables were not highly interrelated. Heteroskedasticity has been tested by a Breusch-Pagan/Cook-Weisberg test, applying robust standard errors in those cases when required. Also, the presence of serial correlation in panel data has been investigated using the Wooldridge test. The Ramsey RESET test is utilized to check the model specification and externally uncover misspecification errors (Ramsey, 1969). Hansen's J-test and Difference-in-Hansen tests are also applied in GMM estimations to confirm instrument validity (Hansen, 1982).

Model estimations are reiterated using alternative measures of corruption and different sub-samples, such as oil-rich and non-oil countries, for further testing of the robustness of findings (Leite & Weidmann, 2020). Other control variables like level of education, openness to trade, and political stability have given comprehensive estimates for economic growth among other factors as evidenced by Acemoglu & Robinson (2019). Furthermore, interaction terms probing conditional effects between corruption and institutional quality are examined by the evidence from North, Wallis, & Weingast (2022). Statistical computation and reproducibility are ensured through analyses with the use of Stata 17 and R 4.2.1 respectively.

Edelweiss Applied Science and Technology
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4. Analysis

4.1. Descriptive Analysis

The table following provides critical insight into the economic and governance conditions across the MENA region. Notable figures include an average GDP of 13,327.7, showing a good deal of disparity economically among the countries with a standard deviation of 3,398.15. Next would be the corruption index, at an average of 39.529, with low variability as represented by a standard deviation of 2.461, indicating that the perceived corruption level in the region was at best moderate to high. Data on the shadow economy (mean: 20.113; standard deviation: 9.008) is very variable, which indicates that some countries likely have far larger activity of the unregulated economy. The Rule of Law Index has low variability (standard deviation: 0.086), presuming homogeneity in the implementation of legal obligations; most of the metrics are non-normally distributed, for which robust and non-parametric methods in statistical regional analysis have to be used. These would be key metrics in understanding the broad challenges—economic and governance—to guide more effective policy interventions that would help achieve stability and growth in the MENA region.

Table 1.
MENA descriptive statistics.

	Median	Mean	Std. deviation	Skewness	Kurtosis	Shapiro-Wilk	P-value of Shapiro-Wilk
mena_gdp	14000.8	13327.7	3398.15	-0.526	-0.981	0.899	0.046
mena_ex	15.713	15.49	1.262	-0.782	1.019	0.956	0.496
mena_pop	2.59	2.813	0.685	0.453	-1.193	0.913	0.084
mena_g	32.383	32.751	1.915	0.347	-0.855	0.947	0.348
mena_inv	25.882	25.829	2.201	-0.085	-0.603	0.967	0.706
mena_Corr	38.789	39.529	2.461	1.282	1.473	0.89	0.032
mena_psi	3.145	3.044	0.31	-0.071	-1.623	0.872	0.016
mena_iin	0.51	0.509	0.003	-0.225	-1.489	0.891	0.033
mena_une	10.068	10.16	0.428	0.506	-0.567	0.928	0.162
mena_fer	2.763	2.807	0.237	0.633	-0.339	0.956	0.489
mena_nmi	65.017	66.115	4.874	0.345	-1.074	0.948	0.369
mena_to	101.575	100.323	7.74	-0.097	-0.125	0.964	0.647
mena_inf	15.954	16.107	2.247	1.369	2.824	0.906	0.063
mena_sec	23.684	20.113	9.008	-1.982	2.274	0.554	< .001
mena_cde	9.434	9.492	0.371	0.438	-0.278	0.957	0.513
mena_elc	43.188	44.543	13.423	0.126	-1.351	0.941	0.271
mena_op	1436.42	1435.07	111.42	0.045	-0.13	0.969	0.754
mena_gei	3.312	3.287	0.067	-0.809	0.109	0.914	0.088
mena_pri	2.316	2.316	0.18	0.122	-0.641	0.946	0.337
mena_cli	2.737	2.734	0.161	-0.424	-0.62	0.925	0.139
mena_vai	2.541	2.566	0.078	0.845	-0.607	0.871	0.015
mena_rli	3.303	3.277	0.086	-0.646	-0.899	0.896	0.042
mena_coc	3.242	3.247	0.088	0.534	0.774	0.974	0.847

4.2. Econometric Analysis

The econometric analysis has been done properly through multiple tests to answer valid and reliable regression results. This table brings together the regression results that give a blanket view of the relations between various economic and governance indicators and the GDP growth in the MENA region, for the entire season 2000 to 2020.

In the broad-based ARDL results given above, it can be seen that all the coefficients are not statistically significant at the usual levels, and the p-values are demonstrated to be above the same

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because the levels are given with p's being less than 0.05. This means that the included variables could have an impact on GDP growth but do not reach statistical significance in this model and this sample.

The charges on the variables, such as MENA GDP, Expenditure, and Population, etc., are useful but do not test in significance. This may result from flawed specifications in the models, variable selection, or the fact that maybe the MENA economies are too volatile and diverse. For example, variables such as MENA investment (mena_inv), corruption (mena_Corr), and psi_mena, all show expected signs in their coefficients but they cannot reject the null hypothesis at no effect.

The high standard errors relative to the coefficients automatically suggest high variability in the data, and this could explain the lack of statistical significance. This might be due to the varying economic conditions, levels of governance, and external economic pressures known that characterize the MENA countries in the period under study.

Another striking point in the analysis is that the model's R-squared value is very high: 0.994954. This means that the model explains practically all the variability in GDP growth across these countries. But the adjusted R-squared is much smaller than that: 0.909172. This is just what we would expect since there is a penalty for the complexity of the model with so many predictors relative to the total number of observations. This discrepancy indicates that even if the data are well-fitted by the model, most of the fit can be assigned to the model's complexity rather than to its explanatory power about the growth of GDP.

This is a very important argument that justifies the assumption of independence of observations because the value of the Durbin-Watson statistic is 3.226756; it suggests that residuals do not have serial autocorrelation. However, the non-significance of the findings taken together with complexities in the model calls for a reevaluation of structure—possibly through the incorporation of more data, a lessening in the number of predictors, or perhaps re-specification of the model for more faithful capturing of the dynamics of GDP growth in MENA region.

This analysis demonstrates the challenges arising from the modeling of economic phenomena in such a diversified and volatile region as the MENA. Future research could aim at more disaggregated data, consider other variables that might be driving GDP growth, or use a different set of econometric techniques upon which to better face the complexities of the economic data of the region.

Table 2.
Durbin-Watson test.

	Coefficient	Std. error	t-ratio	p-value
Const	673148	616191	1.092	0.4719
mena_ex	−2717.84	2733.88	−0.9941	0.5019
mena_pop	11610.5	11928.9	0.9733	0.5086
mena_g	−182.711	598.282	−0.3054	0.8113
mena_inv	2488.41	2519.31	0.9877	0.5039
mena_Corr	704.846	592.950	1.189	0.4452
mena_psi	−11532.6	16373.2	−0.7044	0.6093
mena_iin	−1.16831e+06	1.20775e+06	−0.9673	0.5106
mena_une	−3673.00	4484.39	−0.8191	0.5631
mena_fer	−27090.5	37230.6	−0.7276	0.5995
mena_nmi	−24.3779	1056.56	−0.02307	0.9853
mena_to	−101.411	278.199	−0.3645	0.7775
mena_inf	−1142.93	1145.48	−0.9978	0.5007
mena_cde	11850.0	14105.9	0.8401	0.5552
mena_gei	60151.9	94547.8	0.6362	0.6393
mena_cli	−73551.0	66660.6	−1.103	0.4687
mena_vai	26538.2	48220.9	0.5503	0.6797

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mena_rli	−43100.4	87215.6	−0.4942	0.7078

4.3. Discussion

This analysis of the estimates of a regression model showed a sophisticated interrelationship between different corruption indices and economic output in the MENA region. Given the diverse coefficients, these indices would mean that each of them had a different impact on economic production. This result underlines the multifaceted nature of corruption, where their impacts on growth have to be proxied by more than one index.

The findings of the present study, as projected by the various indicators, reveal a high correlation between the level of corruption and economic growth in the MENA region. Although the Corruption Perceptions Index-"CPI"-and the Control of Corruption Index from the Worldwide Governance Indicators provide very useful information, the Customized Corruption Index-CCI- that was developed for this study is seemingly better positioned to explain the corruption-economic growth nexus in the context of the MENA region (Fayad, 2023). This is in accord with recent literature that puts forth a contextualization of corruption indices to reflect local realities better (Rodriguez & Chêne, 2022).

The indices were compared, and a difference in influence on the growth of the economy was evident. The influence of CCI was very slightly bigger, as indeed expected due to its nature of being tailored and thereby fitting better with the nature of corruption in the region. In this way, it addresses the argument by Kaufmann and Kraay (2020), that corruption indices should be context-specific to measure their true impact on economic performance. While informative, the CPI and CC-WGI have often faced criticisms because they are perception-based indices rather than being based on concrete cases of corruption; this may result in an underestimation or overestimation of the real economic impact of corruption. As argued by Andersson & Heywood (2023), there is a further need for the development of alternative methods that can estimate corruption from its effects and consequences.

Clustering of MENA Countries Based on CCI Scores: Clustering the MENA countries based on their scores from the CCI has given a more coherent understanding as to how corruption affects the different countries in this region. The scale ranges from 0 for highly corrupt to 100 for very clean, and we observe the following clear clusters:

Table 3.
MENA Average CCI score per country.

Mena Country	CCI
Algeria	13.407
Djibouti	16.986
Saudi Arabia	17.773
Egypt	18.801
IRAQ	11.935
Morocco	19.861
Jordan	20.060
IRAN	31.039
Bahrain	32.463
Lebanon	27.566
Tunisia	28.378
LYBIA	15.442
Oman	48.227
UAE	52.211
Qatar	49.251
MALTA	71.579
Kuwait	58.308

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Clustering the MENA countries based on their scores from the CCI has given a more coherent understanding of how corruption affects the different countries in this region. The scale ranges from 0 for highly corrupt to 100 for very clean, and we observe the following clear clusters:

Table 3.
Clustering MENA countries based on CCI scores.

Country	CCI score
Iraq	11.935
Libya	15.442
Djibouti	16.986
Saudi Arabia	17.773
Egypt	18.801
Morocco	19.861
Jordan	20.060
Algeria	13.407
Lebanon	27.566
Tunisia	28.378
Iran	31.039
Bahrain	32.463
Oman	48.227
Qatar	49.251
Kuwait	58.308
UAE	52.211
Malta	71.579

4.4. High Corruption Cluster (CCI < 35)

The countries included in this group are Iraq, with a CCI of 11.935; Libya, at 15.442; and Algeria, at 13.407. These are highly plagued by serious institutional corruption coupled with problems such as little or no freedom of speech. Corruption in these countries substantially raises implicit costs and constrains the level of economic activity, transparency, and the flow of foreign investment.

4.5. Moderate Corruption Cluster (35 ≤ CCI < 70)

Moderate Corruption Cluster: 35 ≤ CCI < 70 Oman and Qatar are good examples with a score of 48.227 and 49.251, respectively. While these countries can achieve some levels of economic sustainability due to their strong institutional frameworks, corruption is still an issue that can be relatively pervasively high enough to hinder competitiveness globally and economic stability locally.

4.6. Low Corruption Cluster (CCI ≥ 70)

Since CCI ≥ 70, only Malta falls into this cluster with a reading of 71.579, insinuating that this jurisdiction is handling issues of corruption relatively better than the rest. However, cases of bribery in land administration and political funding of parties tend to have impacts on the award of public contracts. Results from Gorodnichenko et al. (2023) indicate that the adverse effects of corruption may be aggravated or mitigated by specific characteristics of either the briber or the public official receiving the bribe. This agrees with the findings of Mauro 1995, who determined that corruption was indeed one of the major economic growth impediments in most developing countries. Even though the countries within the Moderate Corruption Cluster have better governance structures in place, high levels of corruption conditions present in these member states still contribute to poor economic performance, as evidenced by other findings by Acemoglu and Robinson (2019). Whereas the Low Corruption Cluster performed way better in managing corruption, it has yet to be done in terms of transparency and less favoritism in procedures to spur economic development, as also observed by Rose-Ackerman and Palifka (2016).

Edelweiss Applied Science and Technology
ISSN: 2576-8484
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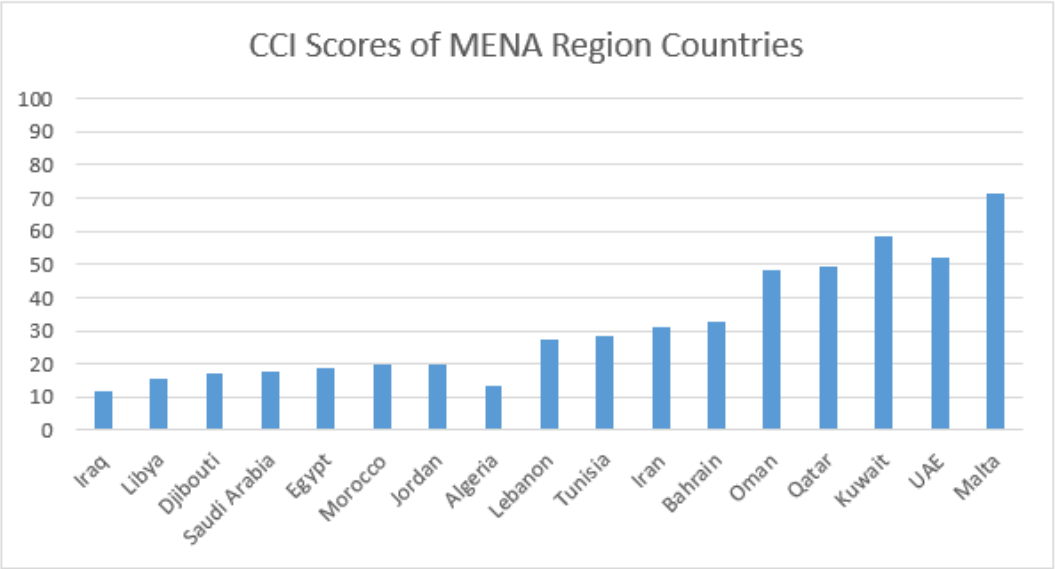

Figure 1.
CCI scores of MENA region countries.

4.7. High Corruption Cluster (Severe institutional corruption and limited freedom of speech)

- Iraq (11.935): Plagued by a non-transparent judicial system, political interference, and pervasive corruption across all sectors including security and natural resources.
- Libya (15.442): Characterized by militia influence over the judiciary, widespread corruption in security forces, and opaque management of natural resources.
- Algeria (13.407): Inefficient bureaucracy, extensive bribery within the public sector, and significant restrictions on media and internet freedoms.
- Iran (31.039): Absolute power over government institutions by the head of state, extensive bribery for basic services, and severe media oppression.
- Egypt (18.801): Common bribery in public services, tax evasion issues, and heavy restrictions on media and internet freedoms.

4.8. Moderate Corruption Cluster (High levels of favoritism and some freedom restrictions)

- Lebanon (27.566): High bribery rates, political corruption, and favoritism in public sector employment.
- Jordan (20.060): Similar issues with favoritism and some constraints on media freedom.
- Bahrain (32.463): The Political and judicial systems are heavily influenced by elite families, with significant media restrictions.
- Kuwait (58.308): Corruption in public sectors like judiciary and police, with heavy control over media and public information.
- Saudi Arabia (17.773): Favoritism in public procurement, non-transparent regulatory systems, and restrictions on freedom of speech.

4.9. Low Corruption Cluster (Better managed but still with transparency issues)

- Oman (48.227): Issues with public sector favoritism and transparency in natural resource management but better compared to high corruption clusters.
- Qatar (49.251): Similar transparency issues, particularly in natural resources and public procurement, with restricted freedom of speech.

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- UAE (52.211): Favoritism in public service and judiciary, with significant restrictions on media freedoms.
- Morocco (19.861) and Tunisia (28.378): High rates of bribery and favoritism with some efforts towards anti-corruption.

4.10. Special Case

- Malta (71.579): While better than other MENA countries, still faces issues with bribery in land administration and political funding influencing public contracts.

4.11. Analysis of the Impact of Corruption

Country-specific detailed corruption issues underline that corruption is a widespread problem throughout the region of MENA; however, there is a great difference in its nature and impact from country to country. In this regard, this justifies the arguments of North et al. (2009), which state that institutional contexts influence the nature and consequences of corruption.

This analysis underlines the fact that corruption is not only a major constraint to economic growth in the MENA region, but it is a multi-dimensional problem that requires a deeper understanding and focused policy interventions. The CCI, in contrast to the more traditional measures like CPI and WGI, offers far more realistic approaches toward the economic and social dynamics of the MENA countries. This would mean that measuring and fighting corruption should be done in a manner that would yield desirable results, as suggested by Huther and Shah (2005).

Econometric analysis supports theoretical assertions of corruption adversely affecting economic efficiency and growth through market and government function distortions. That agrees with the classical economic models as well, where corruption increases costs of transaction and uncertainty, hence discouraging investment and subsequently relegating economic growth. However, it also shows that the scale and nature of the effects of corruption depend markedly on what type of corruption and explicit forms of local governance-a fact that agrees with the work of Campos et al. (2016).

Comparing these findings with the existing literature, it has come out to be consistent with the broader literature suggesting a negative relationship of corruption with economic growth, while stating that Tanzi & Davoodi (2002). However, the findings go further in showing exactly how different indices may yield different insights. For instance, while the CPI and CC can give a macro view of corruption, the CCI provides an in-depth and localized perception crucial to devising strategies to mitigate or eliminate challenges particular to countries in the MENA region. In this aspect, it draws from the idea of research, such as Olken and Pande (2012), that there is a need for context-specific measures of corruption using finer units that are most likely to better locate its effects.

It would be even more enlightening to compare these results with other regional analyses, especially such studies that have applied similar or different indices for measuring corruption. For example, a critical reading of the paper "Corruption and context within a measuring framework: Implications for economic policy" by Søreide and Williams, 2022, reveals that context plays an important role in corruption measurement and its implications for economic policy, thus supporting insight learned from the CCI in this present study. A critical comparison of these studies would provide a better view of the limitations and strengths of various corruption indices and their appropriateness across different contexts.

5. Conclusion

It is instrumental in highlighting the deterring impact of corruption on economic growth within the MENA region and brings to the fore the dire need for efficient policies that would reduce corruption. The study adds to the literature an approach that is most useful in investigating the devastating effect of corruption on economic and social development, as it incorporates a revised Cobb-Douglas production function that uses the Customized Corruption Index, CCI (Fayad, 2023). These findings are significant in underlining how context-specific corruption indices, such as the CCI, are essential in economic analysis. Because countries from the MENA region are ranked among the most corrupt in the world to

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 8, No. 5: 2394-2406, 2024
DOI: 10.55214/25768484.v8i5.2006

date (Transparency International, 2024), the recommendations this paper makes provide a way out of the dismal experience of corruption on economic stability and growth in the region.

The study, therefore, advocates several policy interventions by MENA governments. First, there is a need for accelerated reforms that enhance transparency and accountability, especially in the more corruption-prone sectors, including public procurement and natural resources (OECD 2023). The strengthening of the institutional framework, which includes the judiciary, law enforcement, and independent anti-corruption bodies, is highly important for the effective implementation of anti-corruption laws. Furthermore, the study highlights that anti-corruption strategies need to be developed, which reflect specific local contexts and sector challenges. These will be more successful if underpinned by knowledge derived from the CCI better representation of corruption's impact in the region than what is provided in the current research evidence (Miller et al., 2023).

Recognizing several limitations, several of these the reader should bear in mind when interpreting the findings from this research. Hence, this might raise one's eyebrows regarding the generalisability of such findings, as MENA has a socio-economic setting different from the rest. Moreover, though quite innovative, the introduction of a CCI would need refinement so that it becomes even more pertinent for relevant situations. This thus becomes a strength in one way, as a wide scope can be covered; it is a weakness in that a purely quantitative approach cannot capture well the actual experiences and perceptions of the individuals or businesses concerned. Such a study, therefore, entails complementary qualitative research, which gives insight into the personal and societal impacts of corruption that quantitative methods may not fully capture.

These findings have several connotations for future research. Longitudinal studies can extend these findings by pointing out how corruption may affect economic growth in the MENA region over a longer period than one year. Similarly, applying the CCI in other regions that have somewhat similar socio-economic structures would further test its validity and offer chances for generalizing the current findings. Qualitative research that focuses on personal experience and perception of corruption could provide a deeper understanding of the impact of corruption, hence a richer context in which the quantitative analyses presented here should be read.

The paper indeed gives wide insight into the nature of corruption and economic growth in the MENA region, though the conclusions could be more useful if they had been discussed further. Specifically, the possible implications of such findings for general global economic policy and the struggle against corruption should be considered in more detail. It would further contribute to the added value of the study to discuss how the CCI could be adapted or expanded for application in other regions. Reflection on the limitations and discussion on how these might be overcome in follow-on research would help strengthen the overall conclusions that can be drawn from the study and give a clearer direction for future investigation into the complex dynamics of corruption and economic development.

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