Key determinants of corruption in the Middle East and North Africa

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A B S T R A C T

This study examines the effect of some economic and non-economic factors on corruption. It tests a number of hypotheses formulated around the impact of specific dimensions on increasing or reducing corruption in the Middle East and North Africa Region over a time series from 2008 to 2018. The objective of this study is to illuminate the impact of several independent factors (average income, economic freedom, education, income distribution and globalization) on corruption increase or decrease in the MENA region taking a few countries as a sample case. To reach this end, secondary data is employed and retrieved from secondary sources using published reports and indexes and official websites and databases maintained by various research institutions. The results are tested using panel data regression analysis as a statistical tool for data analysis and hypotheses testing. Findings indicate a significant effect of the presented economic and non-economic determinants on corruption in these sample countries except income distribution which shows an insignificance effect.

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I n t r o d u c t i o n

Most of long outstanding problems in today’s world can be attributed to corruption. Throughout history, corruption has been deeply rooted in human societies and is currently regarded as one of the most inevitable issues in the modern world. There are many common definitions of corruption in the academic literature.

As stated by Gould (1991), corruption can be defined as a moral problem and unethical phenomenon that holds deviation from standard morals of the society and results in disrespect for and mistrust in the established authorities. In similar manner, The Oxford Advanced Learner’s Dictionary (2000) defined corruption as a dishonest or illegal behavior practiced mostly by people in authority positions. It also defined corruption as the act or effect of making people change from moral to immoral standards of behavior. Additional definition was initiated by Shleifer and Vishny (1993) who described corruption as the sale of government properties by government officials for personal gains. On the other side, Osoba (1996) held the belief that corruption is an antisocial behavior that grants perpetrators some illegal gains deviant from societal norms, therefore destructing welfare of other inhabitants. Such definitions have a common ground pointing to betrayal of trust and a benefit to illegitimate beneficiary.

On top of definitions, The World Bank (1997) defined corruption as the misuse of delegated power for personal gains and private interests. This is the straightforward definition that is almost accepted in the literature. The Transparency International classified corruption into grand, petty and political corruption based on the sector and sum of money lost. Grand corruption embraces acts performed at high governmental levels and hits the functioning policies of the nation. Petty corruption is the misuse of entrusted power by low-level and mid-level public officers while interacting with general public who make use of basic public services such as healthcare, education and security services. Political corruption is about decision-makers who manipulate rules and policies in the process of financing and allocating resources and take advantage of their political position to maintain their wealthy and powerful status.

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In this light, corruption can be characterized as one of the hottest issues that exist in both developed and developing world. The World Bank (2013) estimated the total amount of bribes rewarded in both developed and developing countries over 2001 and 2002 by one trillion dollars drawing up about 3 percent of the Gross Domestic Product (GDP) over the period. Recently, numerous policymakers around the world have come to realize the global nature of corruption and its social, political, and economic costs. As argued by Glynn, Kobrin and Naim (1997), no region or country is immune from corruption, therefore, fighting corruption on an international level has been supported through a number of governmental and non-governmental organizations such as the Organization for Economic Cooperation and Development (OECD), the United Nations (UN) and Transparency International (TI).

In particular, most countries in the Middle East and North Africa (MENA) are perceived highly corrupt and corruption levels are recorded at very high levels. The region performs poorly in the Corruption Perception Index (CPI) and the demand for greater transparency and integrity has recently been increasing.

This study came to point to the bad need for extending knowledge and understanding of key variables that contribute to high levels of corruption in the area. Precisely, the study responded to the need to identify the dominant factors that determine corrupt acts that the region was suffering over the past eleven years. This actually implied looking at how and in which direction corruption levels change in response to the change in the prevailing economic and non-economic conditions during the period.

This study aimed at achieving a number of objectives. These include but not limited to:

i. illuminate the impact of a number of independent economic and non-economic factors on corruption’s increase or decrease in the MENA region taking some specific countries as a sample case study.

ii. learn the causes of corruption, how to identify and measure corruption, how to assess the effect of corruption on societies and how anti-corruption policies can effectively respond to this phenomenon.

iii. investigate which independent variable along with its dimensions and elements has the impact on corruption over the past two decades.

iv. Offer a reference document that is appropriate to aid anti-corruption policies in less-developed countries.

The focus in this study was directed towards answering the following four main questions:

i. Do we have corruption in the Middle East and North Africa?

ii. What determines the level of corruption in the Middle East and North Africa?

iii. What is the impact of economic and non-economic factors on corruption?

iv. What are the consequences of corruption in light of the influencing variables?

v. What measures can be taken in order to fight against corruption in the region?

This study about determinants of corruption is one of the fewest conducted in the MENA region.

Apparently, researchers in the MENA region are likely more conservative to search on corruption either because there is no or a little data available on the topic or due to tough regimes and governments in their countries that prevent them from handling such a sensitive issue. Based on this fact, the study will not only help to understand the past of corruption in the area but also predict its future for many years ahead. It is expected to yield a number of benefits to both nation and firms operating within. On top of all this, the core significance of this study lies in the fact that it viewed educational level as a major economic supporter, hence, it was shifted to be a part of economic factors in the research model.

**Literature Review**

**Conceptual Background: An overview of the situation of corruption in six sample countries**

The following section gives an overview of the situation of corruption in six sample countries selected for the purpose of this study.

**Jordan**

The Hashemite Kingdom of Jordan is a small country in the Arab World which falls in the rank of developing countries with humble resources where poverty, unemployment and high debts are central problems. Like many countries in the region during the last decade, Jordan witnessed protests against corruption that sought out for political reforms. Unlike some countries, protests did not grow extremely and did not call for regime change. A notable difference than many countries in the region was the quick move of King Abdullah II to meet some protesters demands by introducing a number of considerable reforms. Despite these reforms, Jordan, is still facing several challenges in fighting against corruption (Schoeberlein, 2019).

**Egypt**

Corruption has been a hot topic in the agenda of the country since the January 25 Revolution in 2011. Yet, despite the change in leadership, most of the revolution’s demands have not been materialized. In contrast, the post-revolution years witnessed an economic drop especially in the sectors of tourism and investment due to political instabilities. Corruption levels increased and continued to be a central problem in the country where people pay bribes instead of taxation to get some basic services. However, following the
revolution, Egypt started a number of institutional reforms and extended its partnerships with the UN and the EU in terms of antimony laundering and anti-corruption programs (Wickberg, 2015).

Lebanon

As reflected by global and regional average scores of performances in most governance areas, corruption in Lebanon is widespread and affects all society levels. Due to political instability, the country has not built the essential needful integrity structures. In contrast, political parties and the Parliament as well as the police and public administration are all perceived as the most corrupt institutions in the country (Wickberg, 2015). Despite the belief that all practices of corruption are sneaky, some forms of corruption are legal due to the absence and/or non-reform and/or lack of implementation of legislations (OECD, 2019).

Morocco

Like some countries in the MENA region, Morocco has witnessed protests during the Arab Spring that sparked in 2011. While protestors were criticizing the government, they did not call for any regime change. The percentage of people believing that government is doing a bad job at addressing corruption has been increasing. However, only very limited evidences were available to confirm the use of bribes as a method to support business. Based on data from World Bank in 2013, only 37% of Moroccan companies were expected to make informal payments to public officials. Nevertheless, the country has been performing better in the CPI since the reported rates of bribery dropped significantly from 48% in 2015 to 31% in 2019 (Schoeberlein, 2019).

Tunisia

In comparison with other countries in the region, Tunisia relatively has a low rate of bribery reported as 18% in 2019. Nevertheless, the corruption perception level has decreased and become a destabilizing factor in the country. It is argued that while corruption was limited to a small circle around the president Ben Ali before the Arab Spring, and while the country transitioned well into a democratic regime thereafter, corruption has become more decentralized and the perceived reality of Tunisian citizens painted an uglier picture (Schoeberlein, 2019).

Yemen

After the Arab Spring, Yemen entered a new political era which was not much different than the era under the former regime. Since the first year of the new rule, political, administration and economic corruption continued to spread widely amongst the country (Azz, 2019). The culture of corruption continued to affect all aspects of both public and private sectors representing Yemen as the most corrupt country in the Arabian Gulf region based on reports from Transparency International Corruption Index (Dbwan, 2014).

In general, the MENA region countries are still suffering to different extents from corrupt practices that are spread over a large scale within both private and public activities as stated by the Corruption Perceptions Index (CPI). The most common forms of corrupt practices in the region may come as financial or non-financial gifts against providing certain services (called bribes) or may also come as favoring some people over others for academic or jobs opportunities on basis other than suitability and capability (called nepotism) (Stiftung 2015).

Popular forms of corruption in MINA

Bribe

It is a straightforward charge that is usually paid to get basic services like school or household or medical services or to avoid a problem with police force. One of the main drivers behind the growth in the percentage of small bribes is the prevailing bureaucracy within the public sector in the MENA region and the fact that public officials are poorly paid so that they become in bad need to improve their living standards (Bearak, 2016).

Nepotism

Even more prevalent than bribes at the level of ordinary citizens in the MENA region, nepotism (Wasta as called by Arabs) is the practice of preferring family, friends and in-group people when it comes to awarding university places, hospital places, jobs, incentives and positions of responsibility (Feghali, 2014).

Theft (at organizational and institutional levels)

It is about taking other person's property without their permission with the intent to deprive the right owner of that property. Also, theft can be used as informal term to describe some crimes against property such as burglary, embezzlement, robbery and fraud. Such form of corruption reinforces illegal practices not only at organizational level but also at institutional level (Barak, 2012).

Research and Methodology

Research Model

The structure of this study shows the relationship between the given variables in a way that allow discussing the effect of independent variables (economic and non-economic) on the dependent variable (corruption).
CORR = F (AY + EF + ED + YD + GL)  
CORR = Level of Perceived Corruption  
AY = Average Level of Income  
EF = Economic Freedom  
ED = Level of Education  
YD = Income Distribution  
GL = Globalization

**Figure 1:** The Research Model; *Source:* The Author

**Data analysis**

**Descriptive Statistics**

Descriptive statistics are broken down into measures of central tendency (including mean, median and mode) and measures of dispersion (including standard deviation, variance, range and skewness) (Trochim, 2020).

<table>
<thead>
<tr>
<th>Variables Symbol</th>
<th>Mean</th>
<th>p50</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Range</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corruption</td>
<td>34.18182</td>
<td>34.5</td>
<td>53</td>
<td>14</td>
<td>39</td>
<td>9.886913</td>
</tr>
<tr>
<td>AvIncome</td>
<td>7239.862</td>
<td>6725.997</td>
<td>14111.19</td>
<td>2570.585</td>
<td>11540.61</td>
<td>3954.343</td>
</tr>
<tr>
<td>EduLevel</td>
<td>74.02539</td>
<td>77.8805</td>
<td>98.23</td>
<td>33.4</td>
<td>64.83</td>
<td>19.94388</td>
</tr>
<tr>
<td>EcoFreedom</td>
<td>58.99394</td>
<td>58.55</td>
<td>70.4</td>
<td>50.2</td>
<td>20.2</td>
<td>4.663438</td>
</tr>
<tr>
<td>Income-r</td>
<td>37.81364</td>
<td>36.7</td>
<td>57.6</td>
<td>28.3</td>
<td>29.3</td>
<td>6.391654</td>
</tr>
<tr>
<td>Globalization</td>
<td>65.01446</td>
<td>67.46582</td>
<td>75.65</td>
<td>41.88</td>
<td>33.77</td>
<td>8.13186</td>
</tr>
</tbody>
</table>

Note: Corrup-n = corruption;  AvIncome = the average level of income; EduLevel = the education level; EcoFreo-m= economic freedom; Income-r = income distribution; Globli-n= globalization

Generally speaking, the mean was used to indicate the central value of variables. The average perception of corruption in sample countries at 34.18 per cent was very low if compared to the average perception of corruption in some countries in the globe over the same period based on Corruption Perception Index (like Denmark 91.18 per cent, USA 73.27 per cent, New Zealand 91 per cent and Japan 95 per cent). On the other side, the standard deviation pointed out data variability from its mean at 9.88 per cent. With this result, the sample countries were still far away from scores of countries that ranked at the highest level of perception. The maximum and minimum were calculated to provide the lowest and highest values across the sample countries respectively. These recorded even more poor indications at lowest 14 per cent and highest 53 per cent. The range was measured to give a value of 39 per cent which is the space between the lowest and the highest.

**Panel Data Regression Analyzes and Selection**

In an attempt to determine the most appropriate model, this study used each of Hausman test and Breusch and Pagan Lagrangian Multiplier test.
Hausman Test

The method of “Hausman Fixed Random” was used to estimate Random Effect versus Fixed Effect. As shown in Table (2), it provided the result of -36.53 indicating the model as Random and not Fixed.

Table 2: Hausman Fixed Random

<table>
<thead>
<tr>
<th></th>
<th>(b) fixed</th>
<th>(B) random</th>
<th>(b-B) Difference</th>
<th>sqrt(diag(V_b-V_B)) S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AvIncome</td>
<td>0.001999</td>
<td>-0.0013054</td>
<td>0.0033044</td>
<td>0.0005006</td>
</tr>
<tr>
<td>EduLevel</td>
<td>0.313062</td>
<td>0.3308473</td>
<td>-0.0177849</td>
<td>0.0491653</td>
</tr>
<tr>
<td>EcoFreedom</td>
<td>0.0389537</td>
<td>0.3480634</td>
<td>-0.3091097</td>
<td></td>
</tr>
<tr>
<td>IncomeDistr</td>
<td>0.0407809</td>
<td>-0.230939</td>
<td>0.2717199</td>
<td></td>
</tr>
<tr>
<td>Globlization</td>
<td>-0.0381022</td>
<td>0.3512248</td>
<td>-0.389327</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Significant level ***; **= p-value < 5%.

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

\[ \text{chi2}(5) = (b-B)\text{'}[(V_b-V_B)^{-1}]\text{'}(b-B) \]

= -36.53 \( \text{chi}2 < 0 \Rightarrow \) model fitted on these data fails to meet the asymptotic assumptions of the Hausman test; see suest for a generalized test

Bresh Pagan Test

On the other side, Bresh Pagan method was used to estimate Pooled OLS versus Random Effect. Based on results in Table (3), the optimal regression to be applied for this study is Pooled OLS. The output of Chibar2(01) = 0.000 yielded that regression for data is Pooled OLS and not Random Effect.

Table 3: Breusch and Pagan Lagrangian Multiplier Test

<table>
<thead>
<tr>
<th></th>
<th>Var</th>
<th>sd = sqrt (Var)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrupt-n</td>
<td>97.75105</td>
<td>9.886913</td>
</tr>
<tr>
<td>e</td>
<td>5.051138</td>
<td>2.247474</td>
</tr>
<tr>
<td>u</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Test: \( \text{Var(u)} = 0 \)
\( \text{chibar2}(01) = 0.00 \)
\( \text{Prob} > \text{chibar2} = 1.0000 \)

Notes: Significant level ***; **= p-value < 5%.

Diagnostic Tests

Diagnostic tests help to attest the nature of the given data and determine what model to apply for the study so as to eventually ensure that results of regression are efficient, compatible and unbiased. For this study relevant diagnostic tests were conducted before boarding into model estimation. The diagnostic tests were concerned with testing normality, multi-collinearity heteroskedasticity and autocorrelation (Kanario, 2017). Regardless the fact that normality is not one of the panel data assumptions since it is classified as distribution-free technique (Henderson, Carroll, & Li, 2008), this study applied the normality test just for checking purposes.

Testing for Normality

In statistical processes, a normality test determines if a sample or group of data fits a standard normal distribution. According to Jim Frost (2019), the normal distribution is the most significant probability distribution in the field of statistics because it fits many natural phenomena such as measurement error and blood pressure. He argued that normal distribution is a probability function that defines how values of variables are distributed. He described normal distribution as a symmetric distribution since observations almost cluster around the central peak while extreme values that are far away from the mean in both directions are questionable. Based on this view, normal distribution is consistent with the mean in a sense that data close to the mean more repeatedly occur than those far from the mean.
As stated earlier, despite the fact that normality check is not one of the assumptions for panel data and in order to follow the traditional statistical methods for data set of this study, skewness/kurtosis test was conducted to test the null hypothesis that residuals were normally distributed. As the p-value gave the result 0.3272 which is greater than 0.05 (p>0.05), this study failed to reject the null hypothesis, therefore concluded that distribution of the residuals was normal and that data did behave normal as shown in Table (4).

Table 4: Skewness/Kurtosis Tests for Normality

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Pr(Skewness)</th>
<th>Pr(Kurtosis)</th>
<th>adj chi2(2)</th>
<th>Prob&gt;chi2</th>
</tr>
</thead>
<tbody>
<tr>
<td>residuals</td>
<td>66</td>
<td>0.1526</td>
<td>0.7504</td>
<td>2.23</td>
<td>0.3272</td>
</tr>
</tbody>
</table>

Testing for Multi-Collinearity

According to Kumari (2008), multi-collinearity is the existence of a linear correlation among the independent variables of a research model which may cause serious forecasting errors and prevent proper assessing of the relative importance of each variable in the model. On the other hand, Alin (2010) argued that multi-collinearity is a state of high inter-associations among independent variables that occurs when two or more independent variables in a regression model overlap and correlate in what they measure making their effects hard to distinguish. Both views would indicate that any change in one variable is linked to any change in another variable; thus, the stronger the correlation, the harder it is to change one variable without changing the other. In addition, Frost (2019) emphasized the fact that correlation is a problem since the normal case is to have variables independent rather than correlated. According to him, it is a kind of disturbance where, if present, any statistical conclusions about data may sound unreliable. In result, since independent variables change in unison, the model will not be able to independently estimate the relationship between dependent variable and each independent variable. In return, any statistical software may respond by eliminating one or more independent variables. For this study, multi-collinearity in regression model was tested since panel data should also meet non-correlation requirement. The test of Pearson’s Correlation Coefficient generated the result shown in Table (5):

Table 5: Pearson’s Correlation Coefficient for Testing Multi Collinearity

<table>
<thead>
<tr>
<th>Variables</th>
<th>Corruption</th>
<th>AvIncome</th>
<th>EduLevel</th>
<th>EcoFreedom</th>
<th>IncomeDistr</th>
<th>Globlization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corruption</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AvIncome</td>
<td>0.0204</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EduLevel</td>
<td>0.6721</td>
<td>0.6377</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EcoFreedom</td>
<td>0.7209</td>
<td>0.1817</td>
<td>0.6243</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IncomeDistr</td>
<td>-0.2356</td>
<td>0.2529</td>
<td>0.1239</td>
<td>-0.183</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Globlization</td>
<td>0.7709</td>
<td>0.4322</td>
<td>0.8782</td>
<td>0.7188</td>
<td>-0.024</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Multi-collinearity can also be tested with the help of tolerance and its reciprocal that is called Variance Inflation Factor (VIF). As stated by Mubayi (2017), if value of tolerance is less than 0.1 and value of VIF equals or above 10, the multi-collinearity will be considered high and problematic. In his book, he argued that the test of Variance Inflation Factor (VIF) identifies not only correlation between independent variables whether positive or inverse but also how severe correlation is. Thus, it precisely estimates the extent to which the variance of any coefficient is inflated due to linear correlation among predictors. Findings came as shown in Table (6) when VIF was tested on the given panel data for this study:

Table 6: Testing of Multi-collinearity (VIF & Tolerance)

<table>
<thead>
<tr>
<th>Variable</th>
<th>VIF</th>
<th>1/VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>EduLevel</td>
<td>7.21</td>
<td>0.138657</td>
</tr>
<tr>
<td>Globalization</td>
<td>5.90</td>
<td>0.169467</td>
</tr>
<tr>
<td>EcoFreedom</td>
<td>2.31</td>
<td>0.433500</td>
</tr>
<tr>
<td>AvIncome</td>
<td>2.05</td>
<td>0.487396</td>
</tr>
<tr>
<td>IncomeDistr</td>
<td>1.18</td>
<td>0.846502</td>
</tr>
<tr>
<td>Mean VIF</td>
<td>3.73</td>
<td></td>
</tr>
</tbody>
</table>

Table (6) indicates that VIF of all variables is less than 10 while, simultaneously, 1/VIF of all variables is more than 0.1. On the other hand, Table (4.5) indicates that Pearson’s Correlation Coefficient between each variable and the other is less than 0.8. Only the
correlation between Globalization and EduLevel provides higher correlation over 0.8, however, the variance inflation factor and its tolerance do not provide a harm results for these variables which provides an indication to neglect this observation. Indeed, these indicated results meant that there is no multi-collinearly and all data is clear with no correlation between variables.

Testing for Heteroskedasticity

As a matter of fact, non-heteroskedasticity of residuals is one of the important assumptions for pooled data. Therefore, it is necessary to make heteroskedasticity check once Panel Data Regression is built. Heteroskedasticity is an issue that rises in many applications throughout both cross-section and time-series data hence causing inefficiency in the estimated results of the regression model. It refers to disturbances in regression whose variances are not constant across observations. For panel data, such variances have to meet the requirement of being constant otherwise the analysis would not be viable (Yobero, 2016).

This study selected the command “xttest3” in Stata 13.0 to calculate a Modified Wald Statistic for Groupwise Heteroskedasticity. The result is provided in the following Table (7).

<table>
<thead>
<tr>
<th>Table 7: The modified Wald test for GroupWise Heteroskedasticity</th>
</tr>
</thead>
<tbody>
<tr>
<td>H0: sigma(i)^2 = sigma^2 for all i</td>
</tr>
<tr>
<td>chi2 (6) = 5.52</td>
</tr>
<tr>
<td>Prob&gt;chi2 = 0.4794</td>
</tr>
</tbody>
</table>

The modified Wald test for GroupWise Heteroskedasticity estimates this model assuming homoskedasticity. Thus, null hypothesis assumes residuals are homoscedastic. Since result in the table shows P > 5 %, null hypothesis that assumes homoskedastic data is accepted, therefore there is a no heteroskedasticity problem in the panel data collected for this study.

Testing for Autocorrelation

Autocorrelation is also called a serial correlation or serial dependence. It is a mathematical representation that measures the degree of similarity between a given time series and a lagged form of itself over sequential time intervals. It has the same concept of computing correlation between two different time series, however, in autocorrelation, the same time series is used twice: once in its original form and once in its lagged version (Smith, 2019).

Autocorrelation occurs when data has a series of numbers that flow into a specific pattern where values in current series can be predicted based on values in preceding series. Autocorrelation is a common issue in time-series regressions. It is viewed as a regression illness giving the indication that the regression analysis model is in error, misspecified and unsound. In other words, when autocorrelation is present, it indicates that a relevant independent variable is missing and omitted from the model; therefore, the model doesn’t explain everything that it is supposed to explain and biased coefficients and misleading p-value are produced (Halcoussis, 2005).

In this study, Wooldridge Test was run to check if panel data has an autocorrelation problem. The command “xtserial” in Stata 13.0 was used assuming the null hypothesis where there is no autocorrelation within data set. The output of this test is presented in the below Table (8).

<table>
<thead>
<tr>
<th>Table 8: The Wooldridge Test for Autocorrelation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wooldridge Test</td>
</tr>
<tr>
<td>F-value</td>
</tr>
<tr>
<td>Prob &gt; F = 0.0155</td>
</tr>
</tbody>
</table>

Based on the result that F=0.0155, the null hypothesis which assumes no dependent correlation was strongly rejected. The output indicated consistent estimates of standard errors that account for clustering within panel data set. Data set has autocorrelation problem; thus, the Driscoll method (i.e., robust method) was used to fix the problem through running Pooled OLS.
Table 9: Driscoll-Kraay Standard Error/Robust for Pooled OLS

| Variables | Coef.       | Drisc/Kraay Std. Err. | t    | P>|t| | [95% Conf. Interval] |
|-----------|-------------|-----------------------|------|------|-----------------------|
| AvIncome  | -0.0013054  | 0.0002827              | -4.62| 0.006| -0.0020321            |
| EduLevel  | 0.3308473   | 0.0177973              | 18.59| 0.000| 0.2850979             |
| EcoFreedom| 0.3480634   | 0.1118852              | 3.11 | 0.027| 0.0604534             |
| IncomeDistr| -0.230939   | 0.1102423              | -2.09| 0.090| -0.5143259            |
| Globlization | 0.3512248  | 0.0830063              | 4.23 | 0.008| 0.1378504             |
| _cons     | -15.49393   | 4.137033               | -3.75| 0.013| -26.12851             |

In Table 9, the (P>|t|) values are the coefficients of the estimated regression model to predict the dependent variable from the independent variables. The (t) value indicates the direction of the relationship. The regression equation can be written as follows:

\[ Y = \alpha + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 \]

Y is the dependent variable of Corruption
a is the intercept
b_1 is the regression coefficient of X_1
X_1 is the independent variable of Average Level of Income
b_2 is the regression coefficient of X_2
X_2 is the independent variable of Economic Freedom
b_3 is the regression coefficient of X_3
X_3 is the independent variable of Educational Level
b_4 is the regression coefficient of X_4
X_4 is the independent variable of Income Distribution
b_5 is the regression coefficient of X_5
X_5 is the independent variable of Globalization

Based on the outputs in Coefficients Table (4.9), the results of testing hypothesis came as follows:

i. **H01** was confirmed revealing a negative significant relationship between corruption and Average Level of Income in sample countries the period between 2008 and 2018
ii. **H02** was confirmed revealing a positive significant relationship between Corruption and Educational Level in sample countries over the period between 2008 and 2018
iii. **H03** was confirmed revealing a positive significant relationship between Corruption and Economic Freedom in sample countries over the period between 2008 and 2018
iv. **H04** was not confirmed revealing no significant relationship between Corruption and Income Distribution in sample countries the period between 2008 and 2018
v. **H05** was confirmed revealing a positive significant relationship between Corruption and Globalization in sample countries the period between 2008 and 2018

**Findings and Discussion**

For the purpose of this study, model summary in Table (5.1) was produced to show the value of R Square which indicated that the five used independent variables were able to interpret and explain 0.8141 (81.41 per cent) of the dependent variable. The Adjusted R square accounted for 0.7986 (79.86 per cent) giving a more realistic indication of the predictive power.

Table 10: Summary Model

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>5172.72589</td>
<td>5</td>
<td>1034.54518</td>
</tr>
<tr>
<td>Residual</td>
<td>1181.0923</td>
<td>60</td>
<td>19.6848716</td>
</tr>
<tr>
<td>Total</td>
<td>6353.81818</td>
<td>65</td>
<td>97.751049</td>
</tr>
</tbody>
</table>

Number of obs = 66  R(5, 5) = 1235.81
Prob > F = 0.0000  R-squared = 0.8141
Adj R-squared = 0.7986  Root MSE = 4.4368
The above table indicates that the current research model which comprised of one dependent variable and five independent variables is in whole significant since “Sig.” is below “0.05” and “F” is above “2”. This means that the research model fits with the data (i.e. the model is fit for testing the hypotheses).

| Variables | Coef.  | Drisc/Kraay Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|-----------|--------|-----------------------|-------|------|----------------------|
| AvIncome  | -0.0013054 | 0.0002827         | -4.62 | 0.006 | -0.0020321         | -0.0005787 |

Going more specific, the results of testing the first hypothesis indicated that corruption in the sample countries is significantly affected by the average level of income through nonlinear relationship as shown in Table (11). Such readings sound somewhat reasonable. Generally speaking, low wages for public officials in developing countries would create opportunities for abuse of public resources, hence, driving public sector towards decline in productivity and efficiency. On one hand, higher wages for public officials would generate a feeling that they are being treated fairly which would increase loyalty and raise motivation so they campaign more efforts to serve work and organization. On the other hand, higher wages would attract good qualified candidates to public sector, thus fostering its ability to control and reduce corruption (de Haan, Dietzenbacher, & Hà Le 2013).

| Variables | Coef.  | Drisc/Kraay Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|-----------|--------|-----------------------|-------|------|----------------------|
| EcoFreedom | 0.3480634 | 0.1118852          | 3.11  | 0.027 | 0.0604534         | 0.6356733 |

Unlike the first hypothesis, the second hypothesis that took the relationship between economic freedom and corruption came with unexpected results as shown in Table (12). While most of the conducted researches found out a negative relationship between economic freedom and corruption, this study revealed a positive correlation between those two variables in a sense that the economic freedom with its present rate within the poor sample countries yields higher opportunities for corruption.

| Variables | Coef.  | Drisc/Kraay Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|-----------|--------|-----------------------|-------|------|----------------------|
| EduLevel  | 0.3308473 | 0.0177973          | 18.59 | 0.000 | 0.2850979         | 0.3765966 |

As shown in Table (13), the results of testing third hypothesis came to confirm that there is a significant effect for educational level on corruption in the sample countries. The relationship has a positive direction where an increase in educational level yields an increase in corruption level. Somewhat, this is an unexpected result since most of the studies that discussed the relationship between corruption and education concluded by acknowledging significant effect for education on the reduction of corruption rate.

| Variables | Coef.  | Drisc/Kraay Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|-----------|--------|-----------------------|-------|------|----------------------|
| IncomeDistr | -0.230939 | 0.1102423         | -2.09 | 0.090 | -0.5143259         | 0.0524478 |

Moving to next variable, the results of analysis in Table (14) pertaining to income distribution did not confirm the fourth hypothesis and indicated that there is no significant relationship between corruption and inequality of income distribution. This can be attributed to the fact that it is poverty represented by low level of wages that has an effect on corruption and not the inequality of income distribution itself. In other words, it is more preferable to have a country with huge income inequality but low poverty levels than a country with low-income inequality but high poverty levels (Brown, 2019).
ever, the rest of the world. As results of analysis in this study showed linear relationship between globalization and

Thus, it is highly recommended that the concerned institutions in sample countries enhance efforts and carry out

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North Africa countries in order to cover wider areas and richen contents of the study with further facts and comparisons.

The sample of six countries in the MENA region selected for the purpos

of this study was a bit small in size. Due to non-availability of data in the relevant sources, it was not possible to embrace more countries in the region like some Gulf countries and more of North Africa countries in order to cover wider areas and richen contents of the study with further facts and comparisons.

Table 15: (Globalization) - Driscoll-Kraay Standard Error/Robust for Pooled OLS

| Variables | Coef.     | Drisc/Kraay Std. Err. | t     | P>|t| | [95% Conf. Interval] |
|-----------|-----------|-----------------------|-------|-------|----------------------|
| Globalization | 0.3512248 | 0.0830063 | 4.23 | 0.008 | 0.1378504 | 0.5645993 |

To end with, confirming the fifth hypothesis, Table (15) points to the significant effect of globalization on corruption, however, the relation goes in a positive direction so the more sample countries are open to globalization the more the opportunity is to practice corruption. Although countries in the region enjoy several benefits from globalization, some negative implications of globalization have caused higher levels of corruption consequently.

Conclusions

To enhance economic freedom in the sample countries, it is first recommended to strengthen the role of anti-corruption institutions. This may include changing some regulations in a way that adapts with the special requirements of both culture and market as well as retaining other regulations that may just need a kind of upgrading to turn out more transparent. From a realistic angel, it is highly recommended to have a model of economic freedom where governments’ role may possibly be switched over from being severe intervener to being more of strict spectator due to the fact that the footprint of government is hard to be totally erased unlike the case in the developed countries.

Once development of economic freedom steps into a more advanced stage, the sample countries institutions may have to start reducing the supply of corruption by increasing wages of public sector officials and applying higher incentives toward honest behavior. Simultaneously, same institutions may also have to start exerting advanced control over dishonest behavior and bad performance which should be met by punishments such as setting financial penalties and lowering level of wages.

Similar to the effect on average income, economic freedom will also increase economic globalization. Hence, the sample countries will be more open to the rest of the world. As results of analysis in this study showed linear relationship between globalization and corruption (putting the sample countries in cross-road between resilience and resistance to globalization), the best that these countries should do may be to find ways to manage the risk of globalization and take the most advantage of its great opportunities and important features.

It is highly recommended that the sample countries emphasize on the importance of integration with each other in order to unify and deepen their Arabian identity, image and culture as a first step to stand for present globalization challenges. They should focus not only on economic competition but also on competition between intelligence and creativity. More importantly, the sample countries should encourage their elite to lead the process of change through more creative initiatives in all cultural fields including media development, image creation, and communication networks.

As corruption in the sample countries looks more as cultural dilemma than being just a political, social and economic challenge, another effective way to remedying corruption from roots may be to employ education to plant healthy seeds that can pass its crops over many generations ahead. In this context, incorporating anti-corruption materials in the teaching systems across the sample countries may increase young students’ awareness of the adverse effects of corruption on their lives. Such anti-corruption teaching materials may require students to carry out various learning activities that aim at building their knowledge about principles, concepts, causes and effects of corruption of all types and also about ways to prevent and overcome its negative consequences.

Finally, since analysis results revealed that income distribution has no significant effect on corruption, this result may probably be attributed to the lack of enough available local surveys and observations that measure income distribution in the same manner that Gini index does. Thus, it is highly recommended that the concerned institutions in sample countries enhance efforts and carry out more advanced surveys to get more supportive figures which may help to give better views about how income is being distributed based on more diverse criteria.

In conclusion, for future researches on the topic of corruption in the sample countries or the MENA region as a whole, general recommendations to researchers may include two important dimensions. First, an assessment for the effectiveness of established public institutions and anti-corruption programs. Second, an examination for the upgraded teaching-materials to ensure containing the value of anti-corruption character.

The sample of six countries in the MENA region selected for the purpose of this study was a bit small in size. Due to non-availability of data in the relevant sources, it was not possible to embrace more countries in the region like some Gulf countries and more of North Africa countries in order to cover wider areas and richen contents of the study with further facts and comparisons.
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Conflicts of Interest: The authors declare no conflict of interest.

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