The impact of Corruption on the Economic Growth of the Arab Countries during the period 2012-2021

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Abstract:

This study aims to investigate the impact between corruption and growth in Arab countries by controlling the various variables that affect growth. The study focuses on whether corruption affects growth and the type of this effect. The applied study is based on data from nineteen 19 Arab countries during the period from 2012 to 2021. To achieve its objective, the study uses static panel models estimated using STATA version 15. Through the Hausman test, when choosing a random effect model (REM), it is found that corruption harms economic growth. The result confirms the hypothesis that corruption is Sand on the Wheels, as it is sand that hinders investment and thus slows down economic growth.

Keywords: Arab countries; Corruption; Economic growth; Panel data**.**

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1. Introduction :

There has been a great debate among economists since 1964 until now about the relationship between corruption and economic growth. A number of economists have adopted the opinion that corruption has a negative impact on economic growth, as corruption is a form of taxation on profits, which may hinder investment in material capital (Romer, 1994).

Also, corruption increases uncertainty about investment returns, which reduces the volume of investment spending, and leads to a misallocation of resources between economic sectors, as it changes the investor's assessment of the comparative advantages of projects, by changing the relative prices of goods and services (Pellegrini & Gerlagh, 2004).

In addition, corruption leads to an increase in the number of implemented government projects, expands their size beyond the optimal size, and increases their complexity, which leads to a decrease in their productivity, and thus a decrease in economic growth (Mauro, 1995).

In the same context, corruption pushes businessmen to invest in political capital instead of human capital, which reduces the returns to accumulating human capital, skills and knowledge(Krueger, 1974).

In addition, corruption reduces the ability of governments to increase their revenues, which could be used to finance education, and this would reduce economic growth. The term Sand the Wheels was used to refer to corruption as the sand that hinders investment, thus slowing down economic growth (Mauro, 1995; Tanzi & Davoodi, 1997).

On the other hand, some theoretical studies have shown that there is a positive impact of corruption on economic growth, due to the ability of corruption to remove the shortcomings and stagnation imposed by governments, which in turn restrict the ability of companies to invest, and limit the ability of entrepreneurs to innovate (Huntington, 2006; Leff, 1964).

Bribery can be used to speed up queues between clients and customers, effectively allocating time between them (Lui, 1985).

It is also more likely that efficient companies will pay large bribes to be awarded the project bid, without losing their allocative competence (Lien, 1986).

Also, corruption in extreme cases is not only desirable, but also necessary to maintain the growth of the economy, and therefore corruption is considered the second best alternative, especially in bureaucratic, incompetent, and poorly managed countries, especially in developing countries, and the expression Grease the Wheels was used, in An indication that corruption is an indispensable grease to facilitate the movement of investment, and thus promote economic growth.

Many criticisms have been made of the view that corruption has a positive effect on economic growth, as corruption does not mitigate shortcomings and bureaucratic inertia, because such inertia is done by bureaucrats; with the aim of obtaining bribes (Tanzi, 1998). Corruption may cause bureaucrats to deliberately slow down the pace of procedures, with the aim of extorting clients and obtaining bribes, which leads to inefficient allocation of time (Leite & Weidmann, 1999).

Awarding projects to companies that have the potential to pay huge bribes in bidding competitions is not necessarily a reflection of their competence, but rather their ability to engage in rent-seeking, which has a negative impact on economic growth (Shleifer & Vishny, 1993).

This study aims to investigate the relationship between corruption and growth in the context of the Arab world, by controlling the various variables that affect growth, and the study tries to focus on whether corruption affects growth and the type of this effect, while identifying the main factors that may help explain Variation in the estimated effects of corruption on economic growth. Do the characteristics of oil abundance in Arab countries and/or political systems provide additional insights into the impact of corruption on growth?

The study consists of five basic sections apart from the introduction. The second section presents the previous literature. The third section deals with the standard model, estimation method and sample selection. The fourth section presents the results of the standard analysis that were reached, and finally the study's findings.

2. Literature Review

Previous applied studies, which aim to study the impact of corruption on economic growth, have witnessed a significant expansion since the mid-nineties, and this may be due to the availability of new and more documented indicators of corruption. This literature revolves around two hypotheses, the first is that corruption has a negative impact on economic growth, and the second is that corruption has a positive impact in economic growth, and they are dealt with through the presentation and analysis of applied studies as follows:

2.1 The negative impact of corruption on economic growth:

Although theoretical studies on the impact of corruption on economic growth are still controversial among economists, the empirical literature on this subject tends to support the view that corruption has a negative impact on economic growth.

Mauro is one of the first scientists to study the relationship between corruption and economic growth for longitudinal panel data for 5 countries for the period (1960 - 1975), using the method of ordinary least squares OLS, and he concluded that the decrease in corruption by one degree; It leads to an increase in per capita GDP by 0.8% (Mauro, 1995).

The impact of corruption on economic growth is transmitted through several channels, namely: investment, education, trade policy, and political stability. In the study of (Pellegrini & Gerlagh, 2004), on a sample of 48 countries, using the least squares method of the two-stage system 2SLS, its results showed that the direct negative impact of corruption on economic growth has It reached 19%, and the impact of corruption on growth is more significant through the investment and trade policy channels, as the relative contribution to the overall impact on economic growth is %32 and 28% respectively.

The study (Mo, 2001) also showed that political instability is one of the most important channels through which the impact of corruption is transmitted on economic growth, and that an increase in the level of corruption by 1% reduces the growth rate by about 0.72%, according to longitudinal data for 54 countries during the period (1970 -1985), using the methods of ordinary least squares (OLS) and least squares two-stage system 2 (SLS).

The negative impact of corruption on growth is exacerbated by weak rule of law, government ineffectiveness, and political violence. In a study (Méon & Sekkat, 2005), and applied to a sample of 63 to 71 countries, during the period (1970-1998), the Generalized Least Squares method was used, and the results showed the negative impact of corruption on both economic growth and investment. These effects vary according to the quality of governance, and they tend to deteriorate when the indicators of the quality of governance deteriorate.

By making an expansion on the internal growth model, to take into account the effects of corruption on the potential productive components of some components of government spending: military and investment, and using the Generalized Method of Moment (GMM) method. And applied to 106 countries during the period (1996-2010), the results of that study showed that the interaction between corruption and both investment and military spending has a strong negative impact on economic growth.

The results also indicate the existence of a complementary relationship between corruption and military spending, which indicates that combating corruption will not only have direct positive effects, but it is also likely to have indirect positive effects, by reducing the size of the negative impact of the military burden, Therefore, policies aimed at reducing corruption and military burdens, perhaps through policies such as regional security agreements, will have a significant positive impact on economic growth (d'Agostino, Dunne, & Pieroni, 2016).

The banking sector is one of the channels for transmitting the impact of corruption on economic growth, as one study aimed to determine the impact of corruption on both the banking sector and economic growth, and it covered 120 countries during the period from 2004 to 2017, using the Three-stage (Least Squares) method (3SLS). The study concluded that there is a positive relationship between corruption and the percentage of non-performing loans in the banking sector, which leads to a deterioration in the integrity of the banking system. As a result, economic growth declines (Hung Son, Gia Khanh, & Thanh Liem, 2020).

in a study of Using an open economy version of the endogenous growth model with global capital mobility (Cieślik & Goczek, 2018), use GMM methods and a sample of 142 countries over the years 1994 to 2014, They test the predictions of the theory empirically. The absence of corruption is determined to have a favorable and statistically significant impact on the growth rate of real per capital GDP and improved the investment ratio using measures of control of corruption from the World Bank. Because investment is hampered by corruption, the empirical findings imply that corruption actually retards economic progress. Changes in specifications and estimation techniques have little impact on the estimated impacts. Thus, it may be inferred that wealthy nations should have faster economic growth and be less vulnerable to the negative impacts of corruption than emerging economies because they have better access to foreign financing.

And in a study by (Alfada, 2019), it studies the impact of corruption on economic growth and determines the corruption threshold in nine member states of the Association of Southeast Asian Nations in 1999-2016. This study assesses whether the effect of corruption promotes growth or deteriorates growth in different categories of corruption using a split sample and threshold model. In contrast to the existing literature, this study does not group countries based on income level and thus can reveal the level of corruption in a country relative to a corruption threshold. The results of the estimate show that the negative impact of corruption on economic growth is stronger for countries with corruption levels above the second threshold of 80.

The Qualitative analysis shows that among Arab countries there is certainly a negative relationship between the gross domestic product (GDP) per capita and high level of corruption (Ahmed & Asmaa, 2016). However, there is no exact relationship between the type of political regime and corruption. Additionally, the study estimated a panel data REM to evaluate the impact of corruption on economic growth in 15 Arab countries during the period (1998 to 2009). The study results support the negative direct impact of corruption on growth in this sample of Arab countries, which confirms "sanding the wheels" hypothesis, yet this impact highly depends on other variables, and namely the governance structure. A good governance structure shows that corruption has a determinal impact on growth. When the governance structure is very poor the impact of corruption on growth tends to be lower or most probably positive, that goes along with "greasing the wheels" hypothesis. Thus, it is necessary to improve the governance quality in Arab countries hand in hand with controlling corruption, in order to achieve better growth performance.

2.2 The positive impact of corruption on economic growth:

The positive impact of corruption on economic growth is a special case and cannot be generalized to all economies of different countries, whether developed or developing, or those that are growing. The most important of these applied studies can be addressed as follows:

Many studies have tried to answer the question: Why is the economic growth of some countries relatively

high, despite their high levels of corruption? The study of (Rock & Bonnett, 2004) found that corruption tends to slow growth and investment in most developing countries, but it contributes to increasing growth in the large industrialized countries of East Asia (the Asian tigers), after the study estimated four different groups of multiple regressions Across the four groups of countries different time periods (1980-1983), (1988-1992), (1989-1996) and (1994-1996).

The study (Li & Wu, 2010) showed that the positive impact of corruption is due to the association of the negative impact of corruption with the general level of trust in society. Having a higher level of trust reduces the negative impact of corruption on economic development, using a pooled data set from 65 countries in two time periods.

Searched by (Méon & Weill, 2010) to tests whether corruption may be an efficient grease in the wheels of an otherwise deficient institutional framework. It analyzes the interaction between aggregate efficiency, corruption, and other dimensions of governance for a panel of 69 countries, both developed and developing. Using two measures of corruption and two other aspects of governance, they observe that corruption is less detrimental to efficiency in countries where institutions are less effective. It may even be positively associated with efficiency in countries where institutions are extremely ineffective. They thus find evidence for the "grease the wheels" hypothesis in its weak and strong forms.

Several cross-country studies have found that corruption is detrimental to economic growth, but the findings are not universally robust. In a study by (Heckelman & Powell, 2010) utilize the economic freedom index to examine if corruption can facilitate growth by allowing entrepreneurs to avoid inefficient policies and regulations when economic freedom is limited. Using regression analysis, they find that corruption is growth enhancing when economic freedom is most limited but the beneficial impact of corruption decreases as economic freedom increases. Not all areas of economic freedom affect the corruption–growth relationship equally. In particular, they find the beneficial effect of corruption disappears most quickly when the size of government and the extent of regulation decrease.

Political institutions can also play a role in mediating the relationship between corruption and growth using data from a panel of more than one hundred countries for the period 1984-2016 (Saha & Sen, 2019). They found clear evidence that the relationship between corruption and growth varies with the type of political institution, and that the growth-promoting effect of corruption is more likely in authoritarian regimes than in democracies. The perceived credibility of the ruling political elites in the long term by promoting economic freedom to do business gives confidence to businesses, which is vital for investment and growth.

Thus, it can be concluded that there is a difference in the results of the empirical literature on the impact of corruption on economic growth. Although many studies have shown a negative impact of corruption on

economic growth, supporting the Sand in the Wheel hypothesis, some studies have found a positive effect of corruption on growth. , especially in East Asian countries, poor developing countries, or those that lack adequate institutions and political and economic freedoms, which supports the hypothesis Grease in the Wheel.

3. Methods and Materials:

To study the impact of corruption on economic growth in Arab countries, panel data models have been relied upon related to 19 Arab countries during the period from 2012 to 2021, with solving the problem of missing data and processing them statistically according to the method of "compensation with average values." To estimate the study models, the statistical program STATA version 15 was relied upon.

3.1 Variables and data of the study:

Depending on the literature of the aforementioned study interested in measuring the impact of corruption on economic growth, the study variables were identified, which many applied studies agreed to affect economic growth in order to gain a more accurate model with a focus on the main variable in the study, which is corruption:

Table N°1: Description of the variables and data of the study

Variable Code	Variable Name	Characteristic of the variable in the study model	Data source
gdp	economic growth	dependent variable	**World Bank database https://data.worldbank.org/indicator/**
cpi	Corruption	The main independent variable in the study model	**Transparency International https://www.transparency.org/en/cpi/2020**
fdi	Investment	Variables added to the study model	**World Bank database https://data.worldbank.org/indicator/**
petr	oil revenues	Variables added to the study model	**World Bank database https://data.worldbank.org/indicator/**
pol	political instability	Variables added to the study model	**World Bank database https://data.worldbank.org/indicator/**
rqual	indicators of the quality of governance	Variables added to the study model	**World Bank database https://data.worldbank.org/indicator/**
Spdmil	Military Spending	Variables added to the study model	**World Bank database https://data.worldbank.org/indicator/**

Source: Prepared by the researchers.

3.2 Correlation between study variables:

Through the results of the correlation matrix, it was found that there is a weak to medium correlation between the variables included in the study model, except for the correlation between the corruption index (CPI) and political stability, whose value was -0.849, meaning that there is a

strong inverse correlation, which may cause the problem of multicollinearity because the variable of political stability is not included in the study form.

Table 2: Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) gdp	1.000						
(2) cpi	-0.358	1.000					
(3) fdi	0.123	-0.110	1.000				
(4) petr	0.395	-0.155	0.427	1.000			
(5) spdmil	0.340	-0.275	0.090	0.549	1.000		
(6) rqual	-0.089	-0.427	-0.033	0.007	0.165	1.000	
(7) pol	0.172	-0.849	0.116	0.125	0.162	0.481	1.000
Source: Prepared by the researchers, based on Stata V.15 output.							

3.3 Tests of Homogeneity in Panel Data (Hsiao Test):

Considering a panel data sample, the first thing that should be checked is the homogeneous or heterogeneous specification generator process data. It is necessary to adopt a procedure of nested homogeneity tests, the general test procedure presented in Hsiao (1986) .

The following table is the result of Hsiao's homogeneity test for the hypotheses of the three stages:

Table 3: Hsiao Test results

hypotheses	F value	Pvalue	the decision
H_0^1	F1 = 244.43894	1.318e-71	
H_0^2	F2 = 6.8137965	9.529e-16	
H_0^3	F3 = 345.02518	2.13e-121	

Source: Prepared by the researchers, based on Stata V.15 output

The first step, which tests the null hypothesis, which states that the sectional units are fully homogeneous, i.e. the fixed term and slopes do not differ across sections, compared to the alternative hypothesis that they are heterogeneous.

As a statistically significant value F (Pvalue = 1.318e-71) was less than 5%, therefore we reject the null hypothesis and accept the alternative hypothesis, that is, there is no homogeneity between the syllable units, and this may be due to the difference in the fixed term or the difference in tendencies.

Therefore, we proceed to the second step to test the null hypothesis that the homogeneity is only in tendencies against the alternative hypothesis that the syllabic units are not completely homogeneous, as a statistically significant value F (Pvalue = 9.529e-16) is smaller than 5%, that is, we reject the null hypothesis and

accept the alternative hypothesis The panel data is not homogeneous, and according to Hsiao's homogeneity test scheme we stop at the second step.

3.4 Estimating static panel models and and choosing the appropriate model:

From the results of the Hsiao test, it is clear that the data of the study sample countries are not completely homogeneous, that is the fixed limit and tendencies differ across developing countries, and in order to confirm this result, we will estimate the three basic static panel models and then compare them.

3.4.1 Estimating static panel models:

The following table shows the results of estimating the Pooled Regression Model:

Table 4: The Pooled Regression Model results

gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
cpi	-4.594	.779	-5.90	0	-6.13	-3.058	***
fdi	-3.382	3.338	-1.01	.312	-9.967	3.203	
petr	3.226	.884	3.65	0	1.482	4.97	***
spdmil	5.237	3.437	1.52	.129	-1.545	12.018	
rqual	-44.295	10.449	-4.24	0	-64.911	-23.679	***
Constant	367.831	57.052	6.45	0	255.271	480.392	***

Mean dependent var	120.908	SD dependent var	168.050
R-squared	0.321	Number of obs	190
F-test	17.430	Prob > F	0.000
Akaike crit. (AIC)	2423.743	Bayesian crit. (BIC)	2443.225

*** p<.01, ** p<.05, * p<.1

Source: Prepared by the researchers, based on Stata V.15 output

It can be seen that the value of the coefficient of determination (32.1%) was low, As for the P value of the significant test (F) the model is significant.

The parameter of the corruption variable was negative and significant at the level 1%, as well as the parameters of the variables oil revenues and indicators of the quality of governance which were significant at the level 1%. As for the investment and military spending variables, they were not significant.

The results of estimating the fixed effects model (FEM) are as follows:

Table 5: Fixed Effects Model results

gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
cpi	-.507	.635	-0.80	.426	-1.76	.747	
fdi	2.715	.772	3.52	.001	1.191	4.239	***
petr	.879	.331	2.65	.009	.225	1.533	***
spdmil	-.021	1.66	-0.01	.99	-3.299	3.258	
rqual	-15.637	17.613	-0.89	.376	-50.412	19.139	
Constant	144.027	43.313	3.33	.001	58.513	229.542	***

Mean dependent var	120.908	SD dependent var	168.050

R-squared	0.119	Number of obs	190
F-test	4.502	Prob > F	0.000
Akaike crit. (AIC)	1730.551	Bayesian crit. (BIC)	1750.033
*** p<.01, ** p<.05, * p<.1			

Source: Prepared by the researchers, based on Stata V.15 output

As it is shown that the value of the coefficient of determination (11.9%) was low, As for the P value of the significant test (F) the model is significant.

The parameter of the corruption variable was negative and not significant, as well as the parameters of the variables investment and oil revenues which were significant at the level 1%. As for the military spending and indicators of the quality of governance variables, they were not significant.

It can be seen that the value of the coefficient of determination (21.6%) was low. The parameter of the corruption variable was negative and not significant, as well as the parameters of the variables investment and oil revenues which were significant at the level 1%. As for the military spending and indicators of the quality of governance variables, they were not significant.

Table 6: Random Effects Model results

gdp	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
cpi	-.751	.615	-1.22	.022	-1.955	.454	
fdi	2.755	.77	3.58	0	1.246	4.265	***
petr	.959	.326	2.94	.003	.32	1.598	***
spdmil	.511	1.628	0.31	.754	-2.679	3.701	
rqual	-15.948	15.615	-1.02	.307	-46.552	14.656	
Constant	157.224	55.635	2.83	.005	48.181	266.267	***
Mean dependent var		120.908	SD dependent var			168.050	
Overall r-squared		0.216	Number of obs			190	
Chi-square		24.894	Prob > chi2			0.000	
R-squared within		0.118	R-squared between			0.227	
*** p<.01, ** p<.05, * p<.1							

Source: Prepared by the researchers, based on Stata V.15 output

3.4.2 Choosing the appropriate model:

In order to choose between static panel models, we will compare the FEM and the pooled regression model based on the Fisher test, we can rely on the Fisher statistic resulting from the estimation of the panel model of FEM (refer to Table (5)). It is evident from the P value of the significant Fisher test (F), whose value was (0.000), which is less than 5%, so we choose **FEM**.

Then we will perform the Breusch and Pagan LM test in order to choose between the REM and the pooled regression model:

Table 7: Breusch and Pagan Lagrangian multiplier test

	Coef.
Chi-square test value	754.90
P-value	0.0000

Source: Prepared by the researchers, based on Stata V.15 output

It shows a statistically significant Chi-square value for this test that is equal to 0.000 and is less than 5%, meaning that the **REM is the best.**

Finally we will perform the Hausman test to choose between the REM and FEM:

Table 8: Hausman (1978) specification test

	Coef.
Chi-square test value	3.052
P-value	.692

Source: Prepared by the researchers, based on Stata V.15 output

The result of the Hausman test shows that the P value is more than 5%, which means rejecting the alternative hypothesis that the FEM is appropriate, and accepting the null hypothesis that the **random effects model is appropriate**.

Table 9: Tests for econometric evaluation of residuals

Normality Test		Autocorrelation Test		Heteroskedasticity Test	
Anderson-Darling	Coef.	Wooldridge test	Coef	Heteroskedasticity	Coef
Z Test Value	8.6101	F Test Value	23.200	F Test Value	0.77
P-value	1.0000	P-value	0.0001	P-value	0.4794

Source: Prepared by the researchers, based on Stata V.15 output

The econometric evaluation of the residuals of the model shows that the residuals follow a normal distribution according to the Anderson-Darling Test, The homogeneity of the residual variance was shown by the Heteroskedasticity Test, But according to a test Wooldridge test the residuals have an autocorrelation problem.

Through the results of the random effect model estimation, we note:

The parameter of the corruption variable had a negative (-0.751) and significant value (0.022) at level 5%, which explains the negative impact of corruption on economic growth consistent with the hypothesis that corruption Sand the Wheels of growth. The investment variable coefficient has a positive (2.755) and significant value at level 1%, which explains the positive impact of investment on economic growth However, the rentier model of the economies of the Arab countries encourages high- and rapid-return investments in real estate and financial speculation, instead of productive investments in promising value-added industrial and agricultural sectors.

The variable coefficient of oil revenues has a positive value (0.959) and is significant at the level 1%, which explains the positive impact of oil revenues on economic growth because most of the economies of Arab countries depend on oil for their revenues (rentier economy). As for the two variables, military spending and the quality of governance, their effect on growth was not significant

4. Concultion:

Based on the data of 19 Arab countries during the period (2012-2021), the empirical analysis of the study showed the negative impact of corruption on economic growth. The important role played by many other variables in the context of Arab countries indicates that the phenomenon is more complex, and therefore the solutions are not straightforward. Reducing the level of corruption does not necessarily mean increasing economic growth in the Arab countries. Economic growth in these countries depends on a number of factors such as oil revenues, investments in real estate and financial speculation.

The adoption of the rentier model in various Arab countries disrupted the spirit of initiative and the desire to invest. The percentage of private investment in most Arab countries is low compared to emerging countries, as private investment usually exceeds 25% of GDP. With the exception of the energy sector, the Arab countries were characterized by their weak ability to attract foreign investments. The rentier model encouraged high- and rapid-return investments in real estate and financial speculation, instead of productive investments in promising value-added industrial and agricultural sectors, which usually require a longer time to reap their profits.

Instead of the state having a leading role in securing the basic infrastructure to provide basic social services, securing a suitable climate for investment, managing economic policy, and redistributing between regions and between social groups, its role was limited to sponsoring a form of capitalism based on cronyism, which was Its businessmen rely heavily on the state to access privileges and investment opportunities in various crooked ways, which has led to the spread of the phenomenon of corruption.

Thus, this study supports the direct negative impact of corruption on economic growth in the Arab countries, which confirms the hypothesis of " sanding the wheels ", however, this effect depends largely on the variables of the governance structure. The good governance structure shows that corruption has a detrimental effect on growth. When the governance structure is very weak, the impact of corruption on growth tends to be less or more likely to be positive, which is consistent with the “greasing the wheels” hypothesis. Thus, there is a need to improve the quality of governance in Arab countries along with combating corruption, in order to achieve better economic growth performance (Ahmed & Asmaa, 2016)

We present all these data to conclude that without a deep review of the development system within the Arab countries, and without moving from an economy based on the distribution of rents and benefits in exchange for political support, to an economy that relies on productive investment in promising economic

sectors, and is based on Opening the way for competition on the basis of economic efficiency and removing legal and administrative obstacles that prevent the establishment and development of small and medium enterprises. The quantitative increase in growth levels alone will not be sufficient to address the structural imbalances that Arab labor markets know and the consequent economic exclusion and psychological frustration among large groups, especially Underrepresented segments such as youth and women.

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