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A cross-sectional econometric study of the impact of administrative corruption on GDP per capita for a sample of 166 countries, during the year 2021

دراسة اقتصادية قياسية مقطعية لأثر الفساد الإداري على الناتج المحلي الإجمالي للفرد، لعينة مكونة من166 دولة، خلال عام 2021

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Abstract :

We aim through this study to show the impact of the risk of the spread of administrative corruption and its impact on GDP per capita of corruption in the country. In our study, we rely on the quantitative approach by applying a simple linear regression model to cross-sectional data that includes most countries of the world. In this research paper, we found the negative impact of administrative corruption on the per capita GDP, from cross-sectional data for the year 2021, for 166 countries. The most important thing that can be suggested through the results to give the highest priority to fighting corruption in the country, regardless of whether it is backward or advanced, noting that any attempt to raise the per capita share of the gross domestic product must take into account the fight against corruption for any mechanism pursued by the state.

Keywords: Corruption, GDP, Cross-Sectional Data, Regression Model.

Jel Classification Codes : B22; E23; C25; p37.

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1. Introduction:

Economic researchers unanimously agree that good governance of states and the power of corporate governance are among the main reasons for economic development and achieving continuous growth rates, and thus achieving prosperity. On the other hand, administrative corruption is considered one of the obstacles that hinder the allocation of economic development and leads to actual bad governance in institutions, whether in the public or private sectors, even if it significantly affects the public sector more, especially in renter countries, in this research paper we test the relationship between administrative corruption And per capita GDP through cross-sectional data for most countries in the world, for the year 2021.

1.1.The main question:

From the above, we can pose the following main question:

What is the impact of administrative corruption on the per capita GDP in the country? What is the appropriate model to measure it?

1.2.Sub-questions:

To be able to understand the main problem, we divide it into a set of questions as follows:

- ✓ What is administrative corruption, and how can it be measured?
- ✓ What is meant by per capita GDP, and how can it be measured?
- ✓ What is the relationship of influence between administrative corruption and the GDP per capita?
- ✓ What is the impact of administrative corruption and the per capita of GDP?

1.3.Study hypothèses:

To reach the desired results, the following hypotheses are made:

- ✓ It can be rely on the econometric model to measure the relationship between GDP per capita and administrative corruption.
- ✓ There is a linear influence relationship between administrative corruption and GDP per capita.
- ✓ There is a direct impact relationship between increasing corruption and the decrease in per capita GDP.

1.4.Importance of the topic:

The topic is considered one of the most important issuesas it takes into consideration the most important topics that raise a lot of controversy, and analysis when comparing countries, namely the phenomenon of corruption, the per capita share of GDP; and the controversial relationship between them.

1.5.Research Methodology:

In our study, we rely on the analytical approach in the theoretical aspect to know the components and items of the study variables by looking at the concepts developed by international bodies and thinkers in this field, while in the applied aspect we rely on the quantitative approach through research and formulation of econometric models that describe us Explicit relationship between variables.

1.6.Previous studies:

We present some studies that were closer to ours, as we noticed a lack of econometric studies that The relationship of influence between administrative corruption and GDP per capita.:

- Study: Nizar Mustafa (October 2014) The Impact of Corruption on GDP per capita, Journal of Eastern Europe and Central Asia Research (JEECAR), Elard University, New Orleans, Los Angeles. The study shows the impact of corruption on GDP per capita. The main objective was to test the hypothesis that there is a strong negative effect of corruption on GDP per capita. The researcher did tests, OLS pool, static effect, and random effect estimates. The result of the study was that the three tests included a strong and statistically significant negative effect of corruption on GDP per capita.

  The difference from our studies is in two important things, the first is that our study relied on a cross-sectional study of most countries of the world, and the second thing is that our study is more recent, with a radical difference in the study model

- Study (August) 2022: Ali Akaravci, Seifuddin Artan, Pinar Hayaloglu and Sinan Erdogan Under the title Economic and Institutional Determinants of Corruption: The Case of Developed and Developing Countries, Journal of Economics and Finance, the objective of the study is the relationships between corruption, economic growth, the use of quality governance, the use of the Internet, in addition to some other institutional and economic variables in 65 developed and developing countries for the period 1999-2016, during this study, dynamic panel data and cross-section use were relied upon .The study concluded. The results of the Enhanced Mean Group (AMG) indicate statistically significant relationships between corruption, economic growth, quality of government, internet use and democracy. The quality of governance also leads to an increase in the rate of economic growth and a

reduction in corruption in these 65 developed and developing countries. The increase in corruption also increases with the increase in Internet users and the level of democracy. In addition to the implications of empirical estimates at the policy level.

- Study (March 2006) by: Fabio Mendeza, Facundo Sepulvedab under the title Corruption, Growth and Political Systems: Cross-Country Evidence, European Journal of Political Economy, Volume 22, Issue 1, March 2006, pp. 82-98, The study touched on the effects of corruption on long-term growth whose main cause is political freedom measures, and the study concluded that there is a non-monotonous relationship between corruption and growth after fixing a number of other related economic variables and limiting The results concluded that increasing the level of corruption achieves a much greater maximum growth than zero, as corruption benefits economic growth when levels of occurrence are low and has a detrimental effect at high levels of infection..

1.7.Organization of the Study:

To be able to understand the study variables and analyze the relationship between them by building the applied model, we divided the research into the following axes:

- ✓ 1st axis: the concept of administrative corruption.
- ✓ 2nd axis: per capita GDP.
- ✓ 3rd axis: estimating the applied study models.

2. The concept of administrative corruption.

In this axis, we discuss the definition of administrative corruption, its various causes, and its measurement indicator adopted in the applied study.

2.1.Definition of administrative corruption:

According to Transparency International and the World Bank Foundation, corruption "amounts to the abuse of power entrusted to private benefit."

Thus, it can be said that there is an international agreement on the definition and it has been assumed that there is a set of laws, rules and regulations that establish a scope for acceptable administrative activities. In administrative work violates the laws rules and foundations that were set forprivate gain would be deemed as an example of administrative corruption. It is obvious that this A definition can be inclusive if its features are comprehensive and its boundaries are clear. In any society, measuring the process of

corruption is relative and is defined according to the principles and values of that society..(Pourkiani & Masoud, 2013, p. 179)

The process of the impact of corruption on inequality in poverty and income through various paths, such as: the application of biased tax systems, including general growth, the composition of human capital formation, the failure of policies targeting social program subsidies, and its impact on the ownership of real estate and financial assets... etc., the inequality in education for all citizens, and the difference in confidence in the accumulation of the composition of the factors of production.(Sanjeev, 1998, p. 5)

2.2.Causes of administrative corruption:

According to what has been done by a number of researchers and other international bodies and institutions such as (the European Commission, the European Bank for Reconstruction and Development, the United Nations, the World Bank Institute, the World Bank Foundation) ... Etc.

In the process of investigating the impact of corruption on microeconomic indicators through different methods, methods and models of corruption, As well as its association with local values and customs, and the way it affects the daily lives of citizens and residents..(Štefan, 2018, p. 3)

The prevalence of much public corruption can be traced back to government intervention in the economy, from which liberalization, stability, deregulation, and private sector orientation policies can reduce the possibility of rentier behavior towards corruption. However, with government legislation in place, and government officials have the discretion to adopt and enforce it strictly, citizens are often willing to offer undue privileges such as bribes and gifts to officials to circumvent laws.

- If the existence of licenses and restrictions on the import of a particular commodity such as cars, for example, is subject to quantitative restrictions, licenses for the commodity to import it become of great value and importers will think and motivate them to offer officials undue gifts and privileges such as bribes in order to facilitate the process of issuing these licenses.
- Government subsidies are often a source of rent, and many studies have shown the possibility of corruption spreading under the industrial policies of governments that are often granted to

companies, and the higher the value of these subsidies available to companies and industries, the higher the rate of spread of the corruption index strongly.

- Different price controls, in order to reduce the price of some subsidized goods at their lowest market value, have a number of reasons such as disasters, earthquakes, drought... Or for social or political reasons. It is also a source of rent and a reason for individuals' rent-seeking behavior. The process of setting and capping prices leads to individuals or groups to bribe officials and offer them undue benefits and gifts in order to ensure the flow of these goods to the market or to obtain an unfair share greater at a lower price than the market price..
- Multiple exchange rate practices and the construction of foreign exchange allocation schemes often lead to rents, for example there are some countries that adopt a multi-exchange system (for importers, for tourists, for investors, etc.) These differences between these prices lead to attempts and a desire to obtain the price of greater interest, although this price may not correspond to the optimal use of the exchange. Often, we find that multiple exchange rate regimes with banking systems that hinder competition where the opportunity for the bank manager to have relationshipsA good government that makes big profits by arbitrage between different markets. There are also some countries that do not have large reserves of foreign currency and distribute them through different development and social schemes, with varying degrees of transparency. If the state's public commercial banks legalized their few foreign currencies by allocating them according to the social and economic priorities set by government officials, the parties concerned might be willing to bribe these officials and offer them undue gifts and benefits in order to obtain a share or more shares than their fair share.
- In the case of low wages of public sector employees, they contribute to employees resorting to using their positions to receive gifts, undue privileges and bribes as a way to cover their expenses, in addition to government laws and legislation contributing to the spread of corruption, other causes of corruption have been identified.
- One of the most important sources of rent is natural resources (mines, timber, oil, gas ...), where the sale process takes place at a price that far exceeds the expenses of extraction and transfer, and often the regulation of its sale is subject to strict government regulation or the work of international organizations such as the stock exchange, for example, through collusion corrupt officials can contribute significantly to the process, as petroleum countries and

resource-rich economies that depend on rents are more vulnerable than others to the trend towards achieving rents.

- Ethnic, social and tribal factors contribute significantly to societal behavior in the search for rents. It has also been ascertained that corruption is linked to the index of ethnic segmentation by language, as officials in departments often grant well-deserved privileges to their relatives or friends in societies where tribal or family ties are large..(Paolo, 1997)

2.3.Corruption Perception Index (CPI):

An annual index published by Transparency International since 1995. The index ranks countries "by their perceived levels Corruption in the public state sector, determined by expert and specialized studies and opinion polls." The index ranks countries around the world according to the degree to which corruption is observed in officials and politicians. The organization defines corruption as the abuse of entrusted power for personal interest (Transparency International,, 2022)

3. GDP per capita:

In this axis, we discuss the definition of gross domestic product on the one hand, and GDP per capita from another perspective.

3.1.Share of countries' share of GDP:

GDP is the sum of the total value added On the part of producers living in the economic system with an increase in duties on goods minus subsidies that are not included in the value of the commodity. The calculation of it is carried out without making deductions for the depreciation of manufactured assets or the consumption of the earth's natural resources.. (World and national data, maps & rankings, 2022)

3.2.GDP per capita:

It represents GDP divided by populationin the middle of the year (World Data Atlas, 2020), and we address it in the applied study, denominated in US dollars in relation to purchasing power parity, in order to be uniform between countries and not fall into error in estimates Which is due to inflation and the country's position in terms of the exchange rate.(THe World Bank, 2022)

3.3.Purchasing power equals:

One of the measures agreed upon when analyzing macroeconomics in order to compare the process of economic productivity and the econometrics of life between countries in general is purchasing power equality (PPP)..(The Investopedia Team, 2022)

Purchasing Power Parity (PPPs) are indicators of differentiation and difference in the level of prices between different countries. It shows the number of national currency units that cost a quantity of goods or products and services in different countries. PPP can be used as currency exchange conversion rates to convert expenditures expressed in national currencies into an intermediate common currency Purchasing power scale, PPS, from which the process of eliminating the effect of price differences between countries is carried out. (Eurostat, 2022)

4. Estimation of applied study models

We build study models according to two approaches. In the first approach, we work on estimating a regression model for the variables of ranking countries according to each indicator, while according to the second approach, we work on the real values of the indicators.

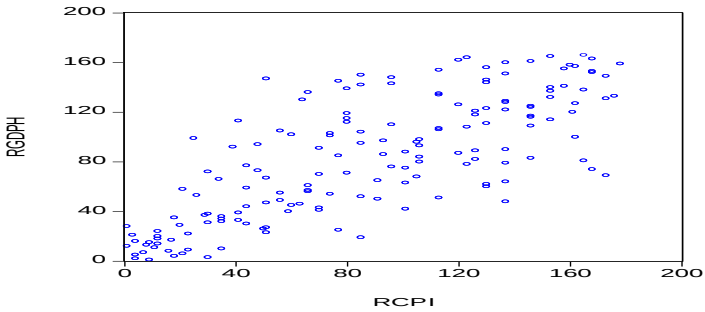
4.1. Model with rank variables:

Before accessing the model estimation, it is necessary to know the shape of the propagation cloud between the two studied variables, and then determine the appropriate model and then estimate it.

A. Representing the relationship graphically:

To know the possibility of the existence and form of the relationship, we draw the scattering cloud:

Figure 1: Scattering cloud between country rank according to the Global Corruption Perceptions Index as an independent variable and country rank according to per capita GDP as a dependent variable for the year 2021 for 166 countries.



Source: Prepared by the researcher based on EViews, and data obtained from:(Transparency International,, 2022)(World and national data, maps & rankings, 2022)

Through the graphic representation, we see the cloud of points spread according to a general direction that can be approximated to a linear shape, as it goes from the bottom left to the top right, which indicates the direct relationship between the two

ranks. The proposed econometric relationship is a simple linear regression model, and its econometric form is written as follows:

$$RGDPH_i = a + b \cdot RCPI_i + \varepsilon_i$$

Where we expect the slope sign to be positive, we know the following:

RGDPHi: Rank of the country (i) by GDP per capita for the year 2021 (dependent variable).

RCPIi: Country rank (i) according to the 2021 Global Corruption Perceptions Index (independent variable).

ε_i : random error.

B. Estimating the model with ordinal variables: Through Appendix No. (1) we write the estimation outputs:

$$RGDPH_i = 20.92 + 0.71 \cdot RCPI_i$$
$$t_a = 4.33 \;\; ; \;\; t_b = 14.99$$
$$(0.000)(0.000)$$
$$R^2 = 57.83\,\% \;\; ; \;\; F = 224.94\,(0.000) \; ; \;\; n = 166$$

C. Evaluation of the model: We depend in evaluating the estimated model on the economic and statistical aspects:

• Economic evaluation:

From the positive indication of the independent variable that represents the ranking of the developing country among all the studied countries in terms of the Global Corruption Perceptions Index, it becomes clear that the higher the country's ranking in the latter (the higher the fight against corruption), the higher the country's ranking in terms of per capita GDP; so, the model is acceptable from an economic point of view due to its compatibility with the economic theory in this regard, and the rationale of this relationship economically.

• Statistical assessment:

The coefficient of determination shows the acceptable strength of the correlation between the two ranks of the state at the level of corruption perceptions and per capita GDP, where the variable of the state's rank at the level of corruption perceptions explains 57.83% of the change in the state's rank at the level of GDP per capita , and the rest is due to other explanatory variables that were not included in the model, as well as to random errors. According to this estimated model, which is a high and very acceptable value, especially since the two variables are ordinal; The correlation coefficient defined by the root of the coefficient of determination of 0.5783 is 0.76, which is a high and acceptable value, and indicates a somewhat solid relationship between the two variables.

As for the student statistics for the parameters of the model, they all appear statistically significant, as the probability of them appears to be zero (0.000), and therefore the student's calculated statistical value for both parameters is greater than the corresponding critical (tabular) values at the level of significance of 5%.

Also for the Fisher statistic, it is statistically significant because it is greater than the critical value at the 5% level of significance, as the probability that it is not significant is estimated at (0.000), which is shown by the probability of the computed Fisher statistic shown in the model; Thus the model as a whole is acceptable so that the linear relationship is a good fit for the relationship between the two variables.

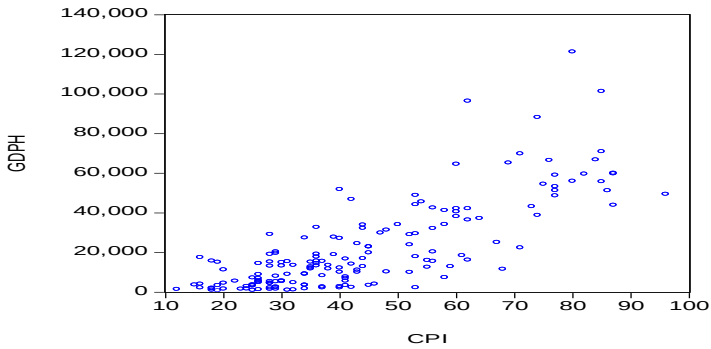
4.2.Models with actual values:

Before accessing the model estimation, it is necessary to know the shape of the spread between the two variables, and then to determine the appropriate model, then it is estimated and evaluated.

A. Representing the relationship graphically:

To find the closest mathematical model that can be formulated to represent the econometric relationship, we represent the regression of the per capita GDP variable on the variable of the Global Corruption Perceptions Index, for all the 166 countries we obtained.

Figure 2: Scattering cloud among the Global Corruption Perceptions Index as an independent variable and per capita GDP as a dependent



variable for 2021 for 166 countries.

Source: Prepared by the researcher based on EViews, and data obtained from : (Transparency International,, 2022)(World and national data, maps & rankings, 2022)

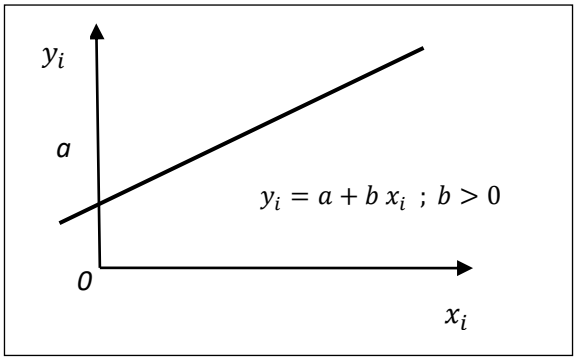
It appears that the cloud of points spreads according to a general direction that can be approximated to either the linear form, as it goes from the bottom left to the top right, which indicates a direct

relationship. Or nonlinear form (exponential with base b). In this regard, we propose two econometric models:

The proposed first econometric relationship is a simple linear regression model whose econometric form is written:

$$GDPH_i = a + b \cdot CPI_i + \varepsilon_i$$

Figure 3: A graphic representation showing the direct relationship in a simple linear model



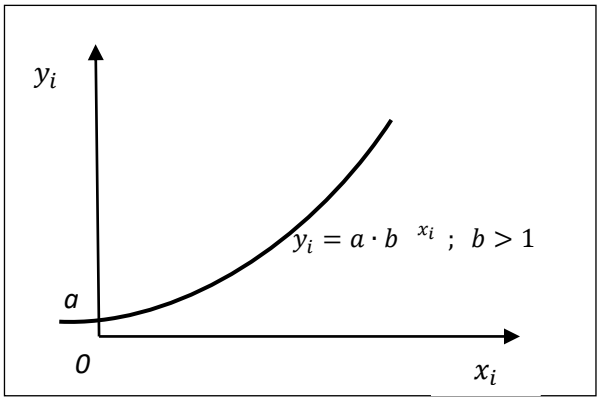
Source: (Dominick & Derrick, 1982, p. 139)

The proposed second econometric relationship is an exponential model with base b and its econometric form is written:

$$GDPH_i = a \cdot b^{CPI_i} \cdot \varepsilon_i$$

Where we expect b > 1, because the relationship is positive.

Figure 4: A graphical representation showing the direct relationship in a base exponential model



Source : (Algebra, 2022)

We know from the above that it is as follows:
GDPHi: Represents GDP per capita in US dollars at purchasing power parity (i) for 2021 (representing the dependent variable)
CPIi: The Global Corruption Perceptions Country Index (i) for 2021 (representing the independent variable).
:ε_i random error.

B. Estimating Relationship 1:

Through Appendix No. (2) we write the estimation outputs in the form:

$$GDPH_i = -17790.84 + 909.83 \cdot CPI_i$$
$$t_a = -6.65 \;\; ; \;\; t_b = 16.32$$
$$(0.000)(0.000)$$
$$R^2 = 61.89\,\% \;\; ; \;\; F = 266.43\,(0.000) \;\; ; \Sigma_{i=1}^{166}(\varepsilon_i)^2 = 3.16 \times 10^{10}; \;\; n = 166$$

c. Evaluation of the model of the relationship 1: We rely on the evaluation of the estimated model on two aspects:

• **Economic evaluation:**

Through the positive reference to the independent variable that represents the value of the country's Global Corruption Perceptions Index, it becomes clear to us that the higher this indicator for the country (the decreasing levels of corruption), the higher the per capita GDP in the country; Hence, the model is acceptable from an economic point of view due to its compatibility with economic theory.

• **Statistical assessment:**

The coefficient of determination shows the strength of the correlation between the Corruption Perceptions Index and per capita GDP, where the Corruption Perceptions Index variable explains 61.89% of the change in per capita GDP, according to this estimated model, and the rest is due to variables In addition to the multi-source random errors, which is an acceptable value. By extracting the correlation coefficient of "Pearson" by adding the coefficient of determination, we find 0.78, which is a rather strong correlation.

As for the student's statistics for the parameters of the model, they all appear statistically significant, as the probability of them appears to be zero (0.000), and therefore the student's calculated statistical value for both parameters is greater than the corresponding critical (tabular) values at the level of significance of 5%.

As for the Fisher statistic, it is statistically significant because it is greater than the critical value at the 5% level of significance, as its probability is (0.000), which shows the probability of the computed

Fisher statistic shown in the model, which is estimated at 266.43 which is greater than its critical value (tabular); Thus the model as a whole is acceptable We make sure that the linear relationship appears to be identical and generally consistent for the relationship between the two variables. From this point of view any pointof view, the estimated model can be accepted statistically.

d. Estimation of Relationship 2:

The second relationship is a hyperbola; As follows:

$$GDPH_i = a \cdot b^{CPI_i} \cdot \varepsilon_i$$

This model is a non-linear model, but the EViews software does not allow it to be estimated directly, so we convert it to the linear form as follows:

$\log(GDPH_i) = \log(a \cdot b^{CPI_i} \cdot \varepsilon_i)$
$\Rightarrow \log(GDPH_i) = \log(a) + \log(b) \cdot CPI_i + \log(\varepsilon_i)$
$\Rightarrow \boldsymbol{log(GDPH_i) = A + B \cdot CPI_i + \mu_i}$
$With: \ A = log(a); \ B = log(b); \ \mu_i = log(\varepsilon_i)$

Through Appendix No. (3), we write the estimation outputs in the recognized form:

$$\log(GDPH_i) = 7.43 + 0.04 \cdot CPI_i$$
$$t_a = 48.48 \ ; \ t_b = 14.17$$
$$(0.000)(0.000)$$
$$R^2 = 55.05\ \% \ ; \ F = 200.90\ (0.000) \ ; \Sigma_{i=1}^{166}(\varepsilon_i)^2 = 103.98; \ n = 166$$

E. Evaluation of the model for relationship 2:

The positive sign of parameter B reinforces the previously existing direct relationship between the two variables, and hence the model is economically acceptable due to its agreement with the economic theory in this regard.

By converting the estimated linear model to its original non-linear form, we find:

$$e^{\log(GDPH_i)} = e^{7.43+0.04 \cdot CPI_i} \Rightarrow \boldsymbol{GDPH_i = 1685.80 \cdot 1.04^{CPI_i}}$$

The parameter b is shown with a value of 1.04 greater than 1, which is consistent with the theoretical model shown earlier.

• **Statistical assessment:**

The coefficient of determination shows the strength From calculating the average correlation number between the corruption indicators

index and GDP per capita, where the variable of the corruption expectations index is clearly and well shown 55.05% of the change in per capita GDP in the country, according to this estimated model, which is an acceptable value. Where with the root of the value 0.5505 we find the correlation coefficient equal to 0.74, which is approximately equal to the previous estimated model, but less than it.

As for the student's statistics for the parameters of the model, they all appear statistically significant, as the probability of them appears to be zero (0.000), and therefore the student's calculated statistical value for both parameters is greater than the corresponding critical (tabular) values at the level of significance of 5%.

As for the Fisher statistic, it is statistically significant because it is greater than the critical value at the 5% level of significance, as the probability that it is not significant is estimated at (0.000), which is shown by the probability of the computed Fisher statistic shown in the model; Thus, the model as a whole is acceptable as the non-linear relationship is a good fit for The relationship between the two variables is better than the linear relationship that was put forward previously. Thus, the measured and statistically expressed model is accepted.

5.Analysis of the results:

Through the applied study, it was found that the relationship is direct, and this indicates that the spread of corruption is followed by a decrease in per capita output; From the estimated model, The degree to which the country's corruption index ranking improves by one degree leads to an increase of 0.71 degrees in the country's ranking according to the per capita GDP. The coefficient of determination of about 58% supports the strength of the relationship between the two studied variables, and indicates the presence of other explanatory variables that were not included in the model in addition to unexplained random errors.

By dealing with the actual values of the two indicators studied, it was found that there are two moral and statistically acceptable models. One of them is a simple linear model that shows the direct relationship between the fight against corruption and the per capita GDP; Through it, it is shown that improving the country's The ranking by corruption index represents a single score that leads to an increase in GDP per capita by US$909.83 on a purchasing power

parity basis. Recruitment coefficient of about 62% supports the strength of the relationship between the two studied variables, and indicates the presence of other explanatory variables that were not included in the model in addition to unexplained random errors.

The second is exponential as it supports this direct relationship; In addition, it shows the acceleration of the increase in the per capita share of the product m. a. When increasing, the country's ranking according to the corruption index with constant values.

A coefficient of determination of about 55% supports the strength of the relationship between the two variables, and indicates the presence of other explanatory variables that were not included in the model in addition to unexplained random errors.

6. Conclusion:

It is common in the economic literature that corruption commissions and payments raise the costs of economic activities, which are added to the prices of goods and services and push inflation rates and the cost of living to higher levels. Corruption thus affects the poor and middle classes to a greater extent, and what makes the matter worse are those effects, whether direct or indirect, on the economic activity in the state, as the GDP decreases, and thus the per capita share of these products decreases, especially with the increase in the population. It increases the income inequality between the different social strata and decreases the fairness of the income distribution among these strata. Many thinkers and specialists blame corruption for the decline in per capita GDP, which is what we saw in practice from the previous study, which included most of the world's countries (166 countries).

As a test of the hypotheses:

we found the following:

- ✓ The first hypothesis: It is true that the simple econometric model was sufficient to model the relationship between per capita GDP and administrative corruption.
- ✓ The second hypothesis: Relatively correct. In addition to the fact that there is a linear relationship between administrative corruption and per capita GDP, there is an exponential non-linear relationship that has been tested and shown to be statistically significant and economically valid.

- ✓ The third hypothesis: is correct, as there is a direct relationship between the improvement in the situation of administrative corruption in countries (the decrease in corruption) and the increase in the per capita share of the GDP of countries.

Results of study :

Through the theoretical and practical side of the study, we reached the following conclusions:

The phenomenon of corruption exists globally, but at very different rates, whether among developing countries or among developed countries, and sometimes there is overlap.

- Developing countries, including Algeria, suffer from corruption more than developed countries.
- Arab countries in general average the rankings in the Global Corruption Perceptions Index for developing countries.

The per capita GDP varies greatly around the world, and sometimes developing countries overlap with developed countries, depending on the situation of each country. For example, some oil-producing countries know an increase in per capita GDP.

The simple model, whether linear or non-linear, is sufficient to model the relationship between corruption and per capita GDP.

Recommendations :

From the foregoing, we offer the following recommendations and suggestions**:**

- ✓ Countries that suffer from a lagging ranking in the field of anti-corruption should benefit from the experiences and expertise of countries that have advanced in the ranking in this field.
- ✓ The need to work on adopting reliance on the policy of reducing corruption by improving the components of the composition of the Global Corruption Index, which is a reason to ensure a significant per capita share of GDP through a positive impact on economic activity in the country. Spreading the culture of reporting corruption, especially in developing countries, and ensuring legal protection for whistleblowers in the case of public reporting.
- ✓ Activating control systems and giving them sufficient powers to investigate, especially in matters that directly affect individual rights.

- ✓ Work to rotate responsibilities and prevent long stays in responsibilities, especially in central departments.
- ✓ The independence and strength of the judiciary remains the greatest guarantor of fighting corruption and achieving human justice. Justice is the basis of the king, especially since corruption has a direct impact on the economic situation of the state.
- ✓ Legislation and economic policies must be tailored to protect the middle class levels and maintain a high level of social justice, especially in countries that know a decline in the level of per capita GDP.
- ✓ Anti-corruption programs must realize that dealing with Corporate governance, Public services for governments in health, education, education in government institutions and income distribution Policies of mechanisms to support economic growth will reduce corruption and increase per capita GDP.

7. Annexes:

Appendix 1: Estimating the model with ordinal variables

Dependent Variable: RGDPH				
Method: Least Squares				
Date: 08/29/20 Time: 12:39				
Sample: 1 166				
Included observations: 166				
Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
C	*20.92062*	*4.828402*	*4.332825*	*0.0000*
RCPI	*0.712788*	*0.047525*	*14.99810*	*0.0000*
R-squared	*0.578344*	*Mean dependent var*		*83.50000*
Adjusted R-squared	*0.575773*	*S.D. dependent var*		*48.06419*
S.E. of regression	*31.30550*	*Akaike info criterion*		*9.737440*
Sum squared resid	*160725.6*	*Schwarz criterion*		*9.774934*
Log likelihood	*-806.2075*	*Hannan-Quinn criter.*		*9.752659*
F-statistic	*224.9430*	*Durbin-Watson stat*		*1.050785*
Prob(F-statistic)	*0.000000*			

Source: Prepared by the researcher based on software output: EViews

Annex 2: Estimating Relationship Model 1

Dependent Variable: GDPH				
Method: Least Squares				
Date: 08/29/20 Time: 13:18				
Sample: 1 166				
Included observations: 166				
Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
C	*-17790.84*	*2672.921*	*-6.655954*	*0.0000*
CPI	*909.3383*	*55.70975*	*16.32279*	*0.0000*
R-squared	*0.618989*	*Mean dependent var*		*22143.36*
Adjusted R-squared	*0.616665*	*S.D. dependent var*		*22402.98*
S.E. of regression	*13870.59*	*Akaike info criterion*		*21.92490*
Sum squared resid	*3.16E+10*	*Schwarz criterion*		*21.96240*
Log likelihood	*-1817.767*	*Hannan-Quinn criter.*		*21.94012*
F-statistic	*266.4334*	*Durbin-Watson stat*		*1.071566*
Prob(F-statistic)	*0.000000*			

Source: Prepared by the researcher based on software output: EViews

Annex 2: Estimating Relationship Model 2

Dependent Variable: LOG(GDPH)				
Method: Least Squares				
Date: 08/29/20 Time: 13:31				
Sample: 1 166				
Included observations: 166				
Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
C	*7.439644*	*0.153446*	*48.48381*	*0.0000*
CPI	*0.045331*	*0.003198*	*14.17414*	*0.0000*
R-squared	*0.550569*	*Mean dependent var*		*9.430393*
Adjusted R-squared	*0.547829*	*S.D. dependent var*		*1.184167*
S.E. of regression	*0.796277*	*Akaike info criterion*		*2.394236*
Sum squared resid	*103.9854*	*Schwarz criterion*		*2.431730*
Log likelihood	*-196.7216*	*Hannan-Quinn criter.*		*2.409455*
F-statistic	*200.9062*	*Durbin-Watson stat*		*0.776779*
Prob(F-statistic)	*0.000000*			

Source: Prepared by the researcher based on software output: EViews

Annex 3 : list of countries that make up the study sample

Rank Gdp p c	Country/ Territory	Gdp P, C / PPP	Rank CPI	C P I	Rank Gdp p c	Country/ Territory	Gdp P, C / PPP	Rank CPI	C P I

1	Luxembour	121293	9	8	41	Hungary	33979	70	4
2	Singapore	101376	4	8	42	Panama	32763	101	3
3	Qatar	96491	30	6	43	Romania	32297	70	4
4	Ireland	88241	18	7	44	Latvia	32205	44	5
5	Switzerland	70989	4	8	45	Greece	31399	60	4
6	United	69901	21	7	46	Croatia	29973	63	4
7	Norway	66832	7	8	47	Malaysia	29526	51	5
8	hong kong	66527	16	7	48	Russia	29181	137	2
9	United	65281	23	6	49	Oman	29053	56	5
10	Brunei	64673	35	6	50	Turkey	27875	91	3
11	Iceland	60061	11	8	51	Kazakhstan	27444	113	3
12	Denmark	59830	1	8	52	Trinidad and	27261	85	4
13	Netherlands	59687	8	8	53	Chile	25155	26	6
14	Austria	59111	12	7	54	Bulgaria	24561	74	4
15	Germany	56052	9	8	55	Mauritius	23942	56	5
16	Sweden	55815	4	8	56	Montenegro	22989	66	4
17	Belgium	54545	17	7	57	Argentina	22947	66	4
18	Australia	53320	12	7	58	Uruguay	22455	21	7
19	Kuwait	51912	85	4	59	Costa Rica	20434	44	5
20	Canada	51342	12	7	60	Mexico	20411	130	2
21	Finland	51324	3	8	61	Belarus	19943	66	4
22	France	49435	23	9	62	Maldives	19698	130	2
23	Saudi	48909	51	5	63	Thailand	19228	101	3
24	United	48710	12	7	64	Dominican	19182	137	2
25	Bahrain	46892	77	4	65	Serbia	18989	91	3
26	Malta	45652	50	5	66	Botswana	18503	34	6
27	Italy	44197	51	5	67	Grenada	17956	51	5
28	New	43953	1	8	68	North	17815	105	3
29	Japan	43236	20	7	69	Venezuela (2	17527	173	1
30	Czech	42576	44	5	70	Suriname	17005	70	4
31	Spain	42214	30	6	71	China	16785	80	4
32	Israel	42194	35	6	72	Barbados	16287	30	6
33	Cyprus	41254	41	5	73	Saint Lucia	16089	48	5
34	Slovenia	40657	35	6	74	Libya	15803	168	1
35	Estonia	38811	18	7	75	Bosnia and	15792	101	3
36	Lithuania	38214	35	6	76	Colombia	15644	96	3
37	Bahamas	37266	29	6	77	Georgia	15637	44	5
38	Portugal	36471	30	6	78	Gabon	15486	123	3
39	Poland	34218	41	5	79	Lebanon	15327	137	2
40	Slovakia	34178	59	5	80	Brazil	15259	106	3

Rank Gdp p c	Country/ Territory	Gdp P, C / PPP	Rank CPI	CPI	Rank Gdp p c	Country/ Territory	Gdp P, C / PPP	Rank CPI	CPI
81	Turkmenistan	15196	165	1	124	Nigeria	5348	146	2
82	Azerbaijan	15001	126	3	125	Bangladesh	4950	146	2
83	Iran (2017)	14536	146	2	126	Pakistan	4884	120	3
84	Albania	14495	106	3	127	Cambodia	4570	162	2
85	Armenia	14220	77	4	128	Papua New	4569	137	2
86	Sri Lanka	13620	93	3	129	Kenya	4509	137	2
87	Moldova	13620	120	3	130	São Tomé and	4128	64	4
88	Peru	13380	101	3	131	Sudan	4122	173	1
89	Ukraine	13341	126	3	132	Cameroon	3804	153	2
90	Paraguay	13210	137	2	133	Yemen (2013)	3688	176	1
91	South Africa	12999	70	4	134	Zambia	3623	113	3
92	Saint Vincent	12983	39	5	135	Nepal	3558	113	3
93	Mongolia	12820	106	3	136	Senegal	3535	66	4
94	Dominica	12659	48	5	137	Tajikistan	3519	153	2
95	Indonesia	12302	85	4	138	Congo Republic	3434	165	1
96	Egypt	12251	105	3	139	Benin	3423	80	4
97	Ecuador	11847	93	3	140	Comoros	3209	153	2
98	Algeria	11820	106	3	141	Zimbabwe	2953	158	2
99	Bhutan	11613	25	6	142	Lesotho	2882	85	4
100	Iraq	11332	162	2	143	Tanzania	2770	96	3
101	Tunisia	11201	74	4	144	Guinea	2670	130	2
102	Jordan	10316	60	4	145	Solomon	2465	77	4
103	Jamaica	10166	74	4	146	Mali	2423	130	2
104	Guyana	10105	85	4	147	Rwanda	2318	51	5
105	Namibia	10037	56	5	148	Ethiopia	2311	96	3
106	Philippines	9277	113	3	149	Afghanistan	2293	173	1
107	El Salvador	9139	113	3	150	Burkina Faso	2280	85	4
108	Bolivia	9086	123	3	151	Uganda	2271	137	2
109	Guatemala	8995	146	2	152	Guinea-Bissau	2071	168	1
110	Vietnam	8374	96	3	153	Haiti	1800	168	1
111	Laos	8150	130	2	154	Sierra Leone	1789	113	3
112	Morocco	7826	80	4	155	Madagascar	1714	158	2
113	Cape Verde	7469	41	5	156	Togo	1662	130	2
114	Uzbekistan	7288	153	2	157	Chad	1645	162	2
115	India	7034	80	4	158	Eritrea (2011)	1625	160	2
116	Angola	6929	146	2	159	South	1495	178	1
117	Honduras	5965	146	2	160	Liberia	1533	137	2
118	Djibouti	5748	126	3	161	Mozambique	1333	146	2
119	Ghana	5637	80	4	162	Niger	1269	120	3
120	Nicaragua	5631	161	2	163	Congo	1143	168	1
121	Kyrgyzstan	5470	126	3	164	Malawi	1143	123	3
122	Mauritania	5412	137	2	165	Central African	984	153	2
123	Myanmar	5355	130	2	**166**	Burundi	782	165	1

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