

Corruption and Economic Growth: Empirical Evidence from North African Countries

Mohammed A. M. Alazraq*

Department of Economics, College of Business Administration – Waddan, Aljufra University, Waddan, Aljufra District, Libya.

*Email: Mohamedesmail13@gmail.com

الفساد والنمو الاقتصادي: أدلة تجريبية من دول شمال إفريقيا

محمد إسماعيل محمد الأزرق*

قسم الاقتصاد، كلية إدارة الأعمال-ودان، جامعة الجفرة، ليبيا

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Abstract

Corruption is described as a social disease that is almost impossible to eradicate once it penetrates a society. The World Bank highlights corruption as one of the principal barriers to sustainable economic and social development. In recent times, its detrimental influence has intensified across various regions.

From a theoretical standpoint, several factors are known to shape economic growth, with corruption positioned prominently among them. Numerous scholars identify corruption as a critical element when assessing the performance of global economies. Economists generally define corruption as "the misuse of public power for personal benefit."

In the context of North African nations, corruption has emerged as a central issue affecting multiple dimensions of economic and social life. Consequently, it stands as a significant obstacle to the region's long-term economic progress. Against this backdrop, the current study explores the causal relationship between corruption and economic growth in five North African countries, employing a panel data analysis covering the period from 2005 to 2020.

Keywords: Corruption, Economic Growth, North Africa, Panel Data.

المخلص

يُعدّ الفساد من الظواهر الاجتماعية الخطيرة التي يصعب استئصالها، لا سيما عندما يتغلغل في النّبي الاجتماعية والاقتصادية لأي دولة. وتشير تقارير البنك الدولي إلى أن الفساد يُشكّل العائق الأكبر أمام تحقيق

التنمية الاقتصادية والاجتماعية المستدامة. وفي ظل تسارع وتيرة التحولات العالمية، تتفاقم الآثار السلبية للفساد بصورة غير مسبوقة. وتُظهر الدراسات ذات الصلة أن ثمة عوامل متعدّدة تؤثر في النمو الاقتصادي، ويُعدّ الفساد من أبرز هذه العوامل وأكثرها تأثيرًا. ويعرّف الاقتصاديون الفساد بأنه "إساءة استخدام السلطة العامة لتحقيق منافع شخصية." وتعاني العديد من الدول من تفشي الفساد، لاسيما في منطقة شمال أفريقيا، حيث يُمثل أحد الأسباب الجوهرية لعدد من التحديات الاجتماعية والاقتصادية، مما يجعله عقبة رئيسة أمام تحقيق النمو الاقتصادي طويل الأمد في المنطقة. وانطلاقًا من ذلك، تهدف هذه الدراسة إلى تحليل العلاقة السببية بين الفساد والنمو الاقتصادي في خمس دول من شمال أفريقيا، وذلك باستخدام نموذج بيانات البانل (Panel Data) خلال الفترة الممتدة من عام 2005 إلى عام 2020.

الكلمات المفتاحية: الفساد، النمو الاقتصادي، شمال أفريقيا، بيانات بانل.

1. Introduction

Corruption remains a critical challenge facing numerous countries, particularly within the developing world, where it manifests across economic, social, and political dimensions. Its adverse effects are deeply entrenched in the fabric of these societies.

This research argues that the persistently high levels of corruption in North Africa have been a major contributor to the region's sluggish economic development. Therefore, it seeks to examine the existence of a statistically significant relationship between corruption and economic growth within this context.

The motivation behind this study stems from the need to address the persistent economic stagnation experienced by North African nations and to assist policymakers in formulating strategies aimed at reducing corruption, enhancing growth rates, and fostering sustainable development.

In the aftermath of the Arab Spring, many North African countries have grappled with heightened political and economic instability. Efforts to restore stability and lay foundations for economic recovery have underscored the importance of combating corruption as a necessary step.

The importance of this study comes from its potential to help decision-makers in North African countries by suggesting a range of effective anti-corruption policies, which will play a crucial role in combating widespread corruption in the region.

According to the Al Jazeera Centre for Studies (2019), the outbreak of Tunisia's Arab Spring was largely driven by economic and social grievances linked to systemic corruption, rather than solely by demands for political freedoms. The initial protests reflected deep-seated frustrations over the widespread injustices endured under the rule of Zine El Abidine Ben Ali.

The increasing scope of corruption, especially in developing economies, has drawn considerable academic attention, with a growing body of research seeking to understand its causes, effects, and potential remedies. As noted by the World Bank (2000), corruption remains the foremost impediment to achieving economic development. For meaningful and sustained growth to occur, addressing both economic and political corruption is indispensable.

In this context, the study examines how corruption impacts economic growth in the five North African countries. Such studies are essential because they shed light on sensitive issues that are of paramount importance and assist decision-makers in North African countries to create and implement the most effective and relevant policies in the fight against corruption.

Accordingly, this study investigates how corruption influences economic growth in selected North African countries over the 2005–2020 period. Understanding these dynamics is vital for crafting effective governance reforms and promoting economic resilience in the region.

The study applies a quantitative approach by analyzing panel data from five North African nations, utilizing econometric methods with E-Views software to assess the impact of corruption on economic performance.

The main hypothesis of the research suggests that high levels of corruption have hindered economic growth in the North African region. Ultimately, the aim is to provide effective and relevant policies that can assist decision-makers in their efforts to reduce corruption, stimulate growth, and drive sustainable development.

2. Literature Review and Theoretical Framework

The relationship between corruption and economic growth has been widely debated in academic literature, producing two major schools of thought. The first group, often referred to as the "*Moralists*," views corruption as an inherent evil that must be eradicated due to its destructive effects on economies and societies. In contrast, the second group, known as the "*Revisionists*," offers a more pragmatic perspective, suggesting that under certain circumstances, corruption can actually facilitate economic activity by circumventing inefficient regulations.

While this study reviews a broad range of perspectives, it provides a balanced analysis grounded in both moralist and revisionist arguments.

2.1. Studies Reporting a Positive or Mixed Impact of Corruption on Economic Growth

Several scholars have examined whether corruption might, under certain conditions, support economic activity. Table 1 summarizes key studies that found a positive or mixed relationship between corruption and growth.

Table 1: Summary of Studies Reporting Positive or Mixed Effects of Corruption on Economic Growth

Study	Year	Data/Method	Main Finding
Leff	1964	Conceptual Analysis	Corruption may stimulate innovation and improve efficiency in rigid bureaucracies.
Huntington	1968	Theoretical Argument	Corruption emerges naturally during modernization.
Lui	1985	Theoretical Model	Corruption reduces bureaucratic waiting times.
Acemoglu & Verdier	1998	General Equilibrium Model	Corruption helps bypass inefficient regulations.
Glaeser & Saks	2006	Empirical Analysis (U.S.)	No significant relationship identified.
Swaleheen	2009	Panel Data Analysis	Positive or insignificant depending on corruption index used.
Campos et al.	2010	Meta-analysis (460 estimates)	62% found no significant relationship between corruption and growth.
Heckelman & Powell	2010	Business Environment Study	Corruption supports growth under restricted economic freedoms.
Huang	2012	Panel VECM (10 Asian countries)	Corruption had a positive impact on growth.

2.2. Studies Reporting a Negative Impact of Corruption on Economic Growth

In contrast, a substantial body of research consistently finds that corruption undermines economic development. Table 2 presents a selection of key studies supporting this view.

Table 2: Summary of Studies Reporting Negative Effects of Corruption on Economic Growth

Study	Year	Data/Method	Main Finding
Mauro	1995	Panel Data (70 countries)	Corruption reduces investment and growth.
Mauro	1997	Cross-country analysis	Corruption harms public revenue, infrastructure, and development.
Mo	2001	Panel Data (54 countries)	Corruption impacts human capital and investment negatively.
Silva et al.	2001	Cross-country study (81 countries)	Corruption lowers welfare and capital productivity.
Pellegrini & Gerlagh	2004	Panel Data (33 countries)	Corruption discourages investment.
Akai et al.	2005	U.S. state-level data	Corruption reduces growth in medium and long term.
Tanzi & Davoodi	1997	IMF Working Paper	Corruption weakens effectiveness of public investment.
Uğur & Dasgupta	2011	Meta-analysis (low-income countries)	Corruption harms growth via human capital and public finance.
Ghazi et al.	2014	Cross-country study	Corruption restricts trade openness, reducing growth.
Tarek & Ahmed	2013	Empirical analysis	Corruption affects governance and economic performance.
Musa et al.	2016	Panel Data (West Africa)	Corruption reduces growth rate by 0.143%.

While some early studies suggest that corruption may, in specific environments, facilitate economic activity, the broader and more recent empirical evidence overwhelmingly points to its damaging effects on economic growth. Particularly in developing regions such as North Africa, the costs of corruption appear to outweigh any potential short-term benefits.

3. Research Methodology

This study investigates the relationship between corruption and economic growth across selected North African countries over the period 2005–2020. Secondary data were collected from reputable sources, such as the World Bank, Transparency International, and the United Nations Development Programme (UNDP).

The analysis employs a panel data approach, utilizing Stata 14 for statistical estimations. The variables included in the model are summarized in Table 3.

The primary model is structured as follows:

$$LGDP_{it} = \beta_0 + \beta_1(Logcpi)_{it} + \beta_2(LOGfdi1)_{it} + \beta_3(loghdi)_{it} + \beta_4(logtradeopnnes)_{it} + \varepsilon_{it} \quad (1)$$

In this equation, LGDPC is the dependent variable, representing the natural logarithm of GDP per capita for country i during period t . Logcpi is the primary independent variable, expressed as the natural logarithm of the Corruption Perceptions Index for country i during period t . LOGfdi1 denotes the natural logarithm of foreign direct investment for country i during period t , and is included as a control variable in the model. loghdi refers to the natural logarithm of the Human Development Index for country i during period t . logtradeopenness represents the natural logarithm of trade openness for country i during period t . Finally, ε is the error term, and β_0 is the constant term.

Table 3: Definitions and Sources of Variables.

Variable	Abbreviation	Time Span	Source
GDP per capita (constant 2015 US\$)	Lgdpc	2005-2020	World Bank
Corruption Perceptions Index	Logcpi	2005-2020	Transparency International
Foreign Direct Investment, Net Inflows (% Of GDP)	LOGfdi1	2005-2020	World Bank
Human Development Index	loghdi	2005-2020	UNDP
Trade (% Of GDP)	logtradeopnes	2005-2020	World Bank

4. Preliminary Data Analysis

Before proceeding with the estimations, graphical trend analysis was performed. Visual inspection indicated that the variables exhibited non-linear patterns with considerable volatility across countries and time. Therefore, the use of logarithmic transformations was validated to stabilize the variance and improve interpretability.

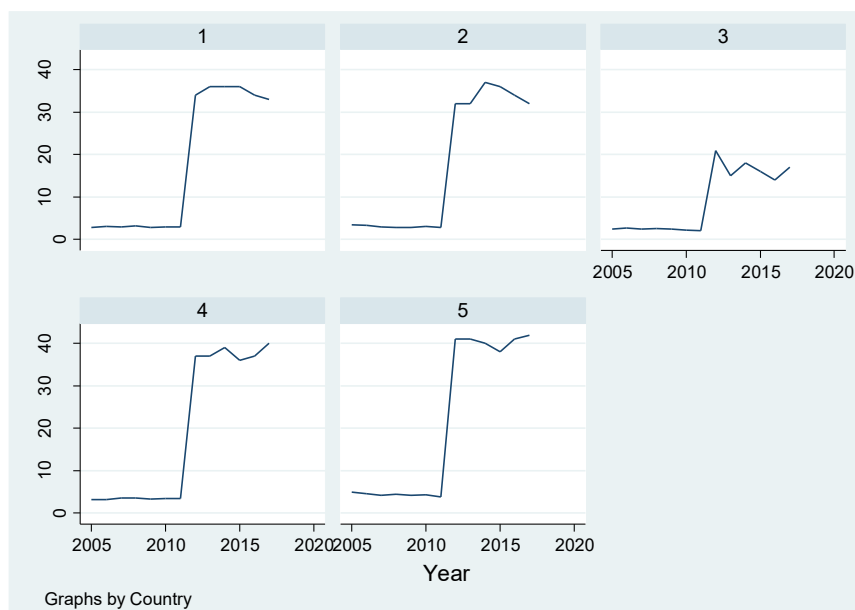


Figure 1: Trends in Corruption Perceptions Index (CPI) by Country (2005–2020)

Source: Author's calculations using Stata software based on Transparency International data.

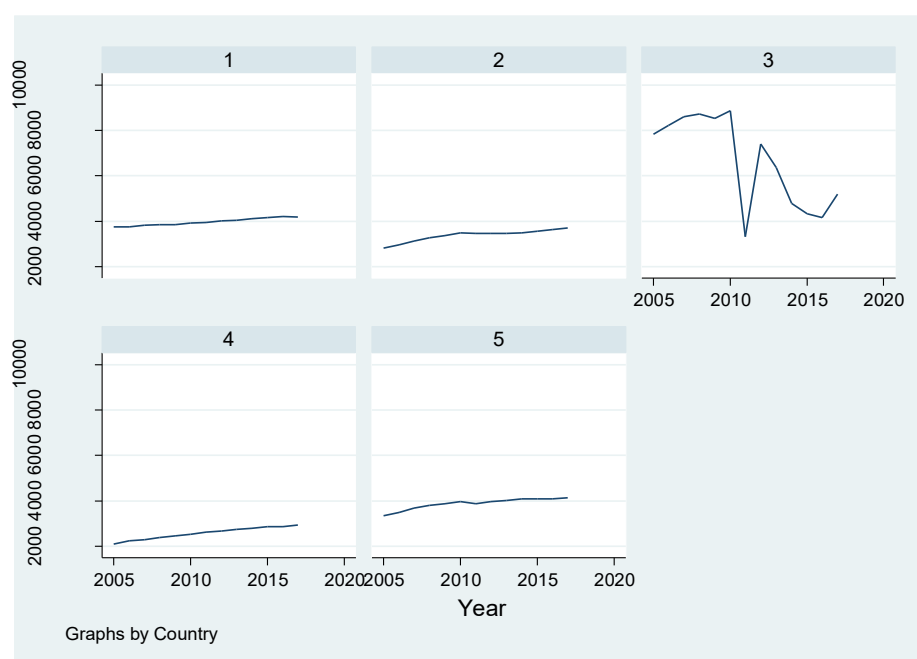


Figure 2: Trends in GDP per Capita (Constant 2015 US\$) by Country (2005–2020)

Source: Author's calculations using Stata software based on World Bank data.

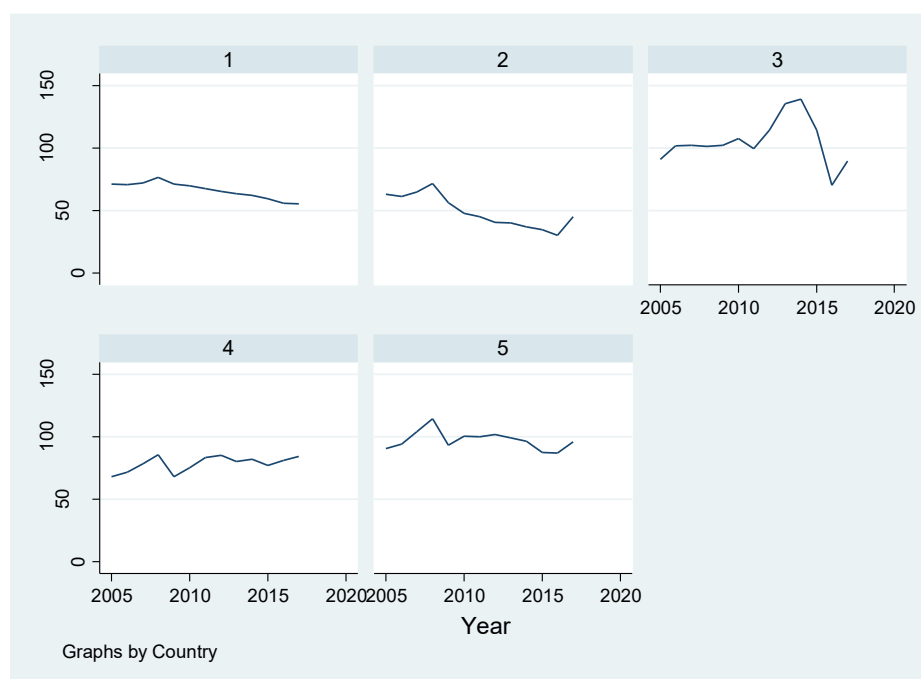


Figure 3: Trends in Trade Openness (% of GDP) by Country (2005–2020)

Source: Author's calculations using Stata software based on World Bank data.

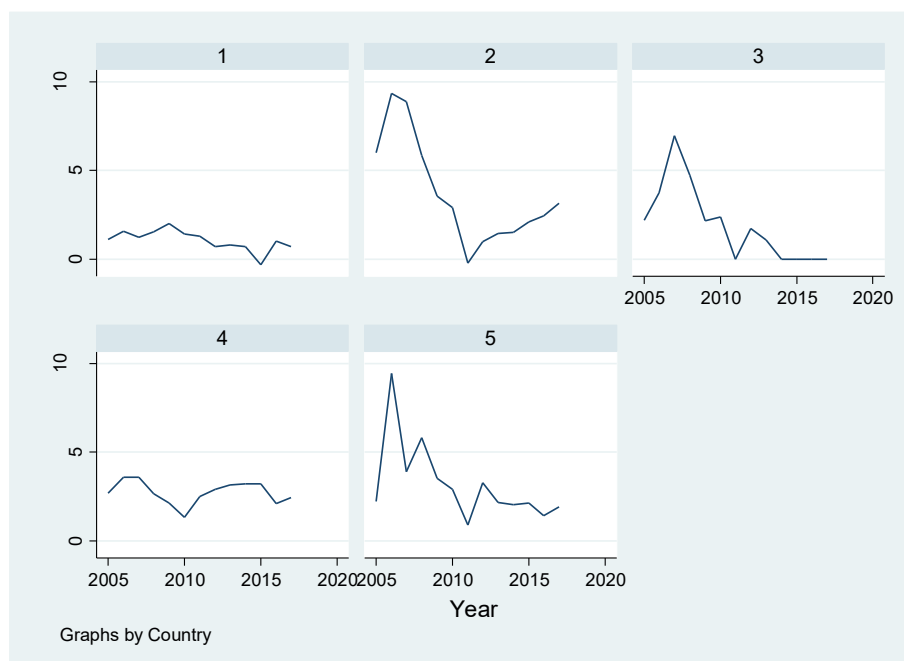


Figure 4: Trends in Foreign Direct Investment, Net Inflows (% of GDP) by Country (2005–2020)

Source: Author's calculations using Stata software based on World Bank data.

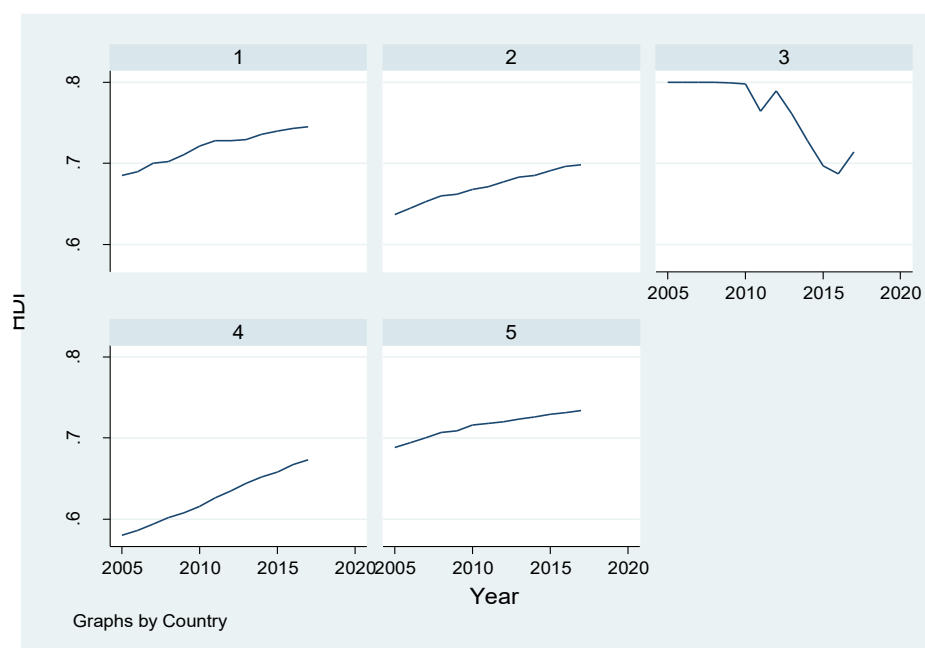


Figure 5: Trends in Human Development Index (HDI) by Country (2005–2020)

Source: Author's calculations using Stata software based on UNDP data.

The graphs show that most variables do not follow a clear linear trend and a significant variability can be seen across countries and over time. For instance, GDP per capita and the HDI increase over time but not at a constant rate, while variables like CPI, FDI, and trade openness show sudden changes and high fluctuations. To deal with these issues and make the

relationships more stable and easier to interpret, the variables were transformed into their natural logarithmic form.

Table 4: Descriptive Statistics

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Lgdpc	65	4093.192	1645.193	2189.062	870.661
Logcpi	65	16.84262	15.92378	2.01	42
FDINETofGDP	65	-2.519913	2.122243	-0.3240121	9.424557
TradeofGDP	65	79.24279	23.23488	30.24655	138.8976
HDI	65	0.6993385	0.544189	0.58	8

Table 4 gives a brief summary regarding the descriptive statistics of the used variables. The data is formed of 65 observations. The average GDP per capita (in constant prices) is about 4093.19, and its standard deviation is 1645.19, which indicates some variation among countries. The Corruption Perceptions Index (CPI) has an average of 16.84, indicating high levels of perceived corruption across the sample. Foreign direct investment (FDI) as a share of GDP shows a negative mean (-2.52), suggesting low or negative investment flows. Trade openness has a mean of 79.24 and varies widely, ranging from 30.25 to 138.90. The Human Development Index (HDI) has an average value of 0.699, reflecting medium levels of human development among the countries.

5. Multicollinearity Testing.

Table 5: Multicollinearity Diagnostic Results

Variable	VIF	1/VIF
LOGfdi1	1.24	0.808471
logtradeop~s	1.22	0.819823
loghdi	1.19	0.838722
logcpi	1.19	0.843574
Mean VIF	1.21	

Since Mean VIF (1.21) < 5, there is no multicollinearity in the model.

Next, the appropriate model can now be determined using three tests: the F-test, the Lagrange Multiplier (LM) test, and the Likelihood Ratio (LR) test.

6. Model Selection.

Table 6: Model Specification Tests.

Test	Individual Effect	Time Effect
F	present	Absent
LR	present	Absent
LM	present	Absent

Finally, if the effects are uncorrelated with the independent variables, the Random Effects (RE) model is appropriate. If they are correlated, the Fixed Effects (FE) model should be used. Here, the Hausman test will be applied. Hausman specification test is a decisive test used when choosing between fixed effects and random effects model (Gujarati, 2003: 651).

The hypotheses of the Hausman test are as follows:

H₀: The Random Effects model is appropriate (RE is consistent and efficient).

H₁: The Fixed Effects model is appropriate (RE is inconsistent).

$$\text{Prob} > \chi^2 = 0.2837 > 0.05$$

According to the results of the Hausman test, the null hypothesis (H₀) cannot be rejected. Therefore, the Random Effects (RE) model is preferred, as it is both consistent and efficient.

In cases where the assumptions of homoskedasticity or no autocorrelation may be violated, a Robust Hausman Specification Test is applied. This version of the test relies on robust (heteroskedasticity-consistent) standard errors or variances obtained through bootstrap methods, providing more reliable results under general conditions.

Robust Hausman Specification Test results were as follows:

$$\text{Prob} > \chi^2 = 0.1443 > 0.05$$

H₀: Random Effects model is consistent and efficient.

H₁: Random Effects model is inconsistent; Fixed Effects model is preferred.

According to the results, H₀ cannot be rejected and therefore RE is preferred because it is efficient and consistent.

Based on the results of the applied tests, the one-way Random Effects (RE) model, accounting for individual effects, was selected for further analysis. After selecting the appropriate model, diagnostic tests will be conducted to examine potential deviations from the basic assumptions.

7. Addressing Model Assumptions.

Table 7: Results of Diagnostic Tests for Model Assumptions

Autocorrelation	Heteroscedasticity	Cross Sectional Dependence	Normality
present	present	present	present

As a result of the presence of heteroskedasticity, autocorrelation, and cross-sectional dependence identified in the diagnostic tests, the Driscoll-Kraay estimator was employed. This method provides robust standard errors that are resistant to these issues (Tatoğlu, 2020: 340). Accordingly, the final model was estimated using Driscoll-Kraay standard errors, and the results are interpreted based on this robust specification.

8. Final Estimation and Interpretation

Table 8: Panel Data Regression Analysis Results

Dependent Variable: Lgdpc				
Variable	Coefficient	St. Error	T-Statistic	Probability Value
<i>Logcpi</i>	.0582777	.0179821	3.24	0.007
logtradeopnnes	-.6033007	.0901028	-6.70	0.000
loghdi	4.092424	.7498249	5.46	0.000
LOGfdi1	-.0933365	.0247833	-3.77	0.003
cons	14.22132	.3612471	39.37	0.000
Within R-squared = 0.7713				
Prob > F = 0.0000				

From the estimated model in table 6, we can construct the final estimation equation as follows:

$$LGDP_{it} = 14.22132 + (0.0582777)Logcpi_{it} - 0.0933365 LOGfdi_{it} + 4.092424loghdi_{it} - 0.6033007logtradeopenness_{it} \quad (2)$$

The explanatory power of the model indicates a high goodness of fit, as reflected in the R-squared value associated with the Random Effects (RE) estimation results. Specifically, approximately 77% of the variation in GDP per capita is explained by changes in the independent variables. Furthermore, the overall significance of the model is confirmed, as the p-value of the F-statistic is statistically significant.

Based on the results of the panel data regression analysis, the coefficient of logcpi indicates that a 1% increase in the Corruption Perceptions Index leads to a 5.8% increase in GDP per capita (less corruption = more growth). Similarly, the coefficient of loghdi suggests that a 1% increase in the Human Development Index results in a 4.09% increase in GDP per capita. In contrast, the coefficient of logtradeopenness shows that a 1% increase in trade openness is associated with a 0.60% decrease in GDP per capita.

The results also show that a 1% increase in foreign direct investment (FDI) leads to a 0.09% decrease in GDP per capita. Although this coefficient is statistically significant, it raises important discussions from an economic theory perspective. One possible interpretation is that, due to the high levels of corruption prevalent in North African countries, foreign investment is not efficiently allocated to productive sectors. Alternatively, it could be argued that since FDI typically yields long-term benefits, its positive effects on economic growth may not be immediately observable in the short term.

Our findings are consistent with previous studies by Türkdönmez (2019), Mo (2000), Musa et al. (2016), and Uğur and Dasgupta (2011), which conclude that corruption has a negative effect on economic growth. However, some researchers, such as Huang (2012) and Swaleheen (2009), have found a positive relationship between corruption and economic growth.

9. Conclusions and Recommendations

Corruption is a disease that does not have a specific shape or form, and it causes various effects and can manifest in different ways. Once it becomes prevalent in a society, it is difficult to eradicate. Furthermore, corruption is not just an issue in developing countries; it affects both rich and poor nations alike. According to the literature, corruption can have two effects on economic growth: one beneficial and one detrimental.

According to Transparency International's Corruption Perceptions Index, most North African countries have consistently ranked among the most corrupt countries. At the same time, these countries' growth rates remain modest compared to many other regions. In this context, the purpose of this study was to investigate whether there is a systematic relationship between corruption and economic growth in the North African region. Furthermore, the study investigates whether this relationship is positive or negative. This study aims to provide insights into these dynamics.

The analysis results indicate that a 1% increase in the Corruption Perceptions Index leads to a 5.8% increase in GDP per capita, suggesting that lower levels of corruption are associated with higher economic growth.

The study also recommends that North African countries benefit from the experiences of nations that have successfully battled corruption and achieved high economic growth rates. In this context, it proposes exchanging expertise with countries that have a long history of

economic reform, such as Malaysia and New Zealand, to reorganize the economy and boost development.

Most of Transparency International (TI) reports have shown that North African countries have had significant levels of corruption for a long time and that this issue persists today. As a result, this study urges authorities and decision-makers to take the rising corruption levels in North Africa seriously and to begin investigating both the visible and hidden causes of this societal issue. Governments should be more transparent in their policies and regulations. Corruption can only be reduced by establishing a system where those implicated are held Accountable.

Finally, avoiding political corruption and encouraging transparency in political institution are crucial for reducing corruption rates and restoring public trust in government. As Transparency International points out, governments aiming to accelerate economic growth in the North African region must manage conflicts of interest, control political financing, ensure free and fair elections, regulate lobbying activities, empower civil society, and combat preferential treatment by strengthening checks and balances.

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Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that they have no conflict of interest.

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