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Measuring and Analyzing the Effect of Corruption on Tourism Investment in Iraq Using the NARDL Model

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Abstract: The research aims to analyze the relationship between corruption and investment, and measure and analyze the effect of corruption on tourism investment in Iraq for the period (2003 - 2021) using the NARDL model.

The research found that there is a long-term, non-linear inverse relationship between corruption and tourism investment in Iraq. In addition, increasing the corruption perceptions index (decreasing corruption rates) by (1%) will lead to an increase in tourism investment in Iraq by (1.77%), while decreasing corruption perceptions index (increasing corruption rates) by (1%) will lead to a decrease in tourism investment in Iraq by (1.69%).

The research recommends the need to improve the investment environment in Iraq and provide support and facilities to investors in the tourism sector, by facilitating administrative procedures, reducing bureaucracy, improving infrastructure and logistics services related to tourism, and reducing costs and taxes on tourism investments.

Keywords: corruption, corruption perceptions index, tourism investment, NARDL, Iraq.

Introduction

There is no doubt that corruption is one of the most important problems of the era, which affects human economic, social, political and environmental life, corruption is the main reason for the decline of the economic sectors of most countries in the world, as well as the main reason for the survival of many countries in what is called (the Third World or developing countries), which in turn, leads to many social problems, the most prominent of which is poverty, in addition to changing social concepts, such as spreading a culture of vice represented by bribery, theft of public funds, and the trade in contraband, in addition to the destruction of the environment.

Tourism in 21st century, is considered one of the most important sectors that enhance the economic growth of many countries of the world, especially developed ones, as tourism is no longer just an entertainment field for individuals, but has become an industry in its own right, linked by forward and backward links to various economic sectors. In addition, the tourism industry is one of the most industries are environmentally friendly, and Iraq is one of the countries in the world that possesses more than three thousand archaeological sites, resulting from its civilizational and cultural richness, in addition, Iraq enjoys diverse terrain and an almost temperate climate throughout the year, these factors are considered strengths for the emergence of the tourism industry in Iraq, however, the

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reality indicates that the tourism sector constitutes less than (1%) of Iraq's gross domestic product for the period (2003-2021). During the same period, Iraq's name emerged internationally as one of the most corrupt countries in the world, so what is the role of corruption in Iraq's tourism sector?

Research problem:

The research problem is focused on the following question:

- Does corruption affect tourism investment in Iraq?

Research hypothesis:

The research starts from the hypothesis that:

- The existence of a long-term non-linear inverse relationship between corruption and tourism investment in Iraq.

Research aims:

The research aims to achieve the following objectives:

1. Analyzing the relationship between corruption and investment.
2. Estimating the impact of corruption on tourism investment in Iraq.
3. Knowing the extent to which tourism investment is able to return to balance when a corruption shock occurs.

Research Methodology:

The research relies on the deductive approach in measuring and analyzing the impact of corruption on tourism investment in Iraq using the economic measurement method (NARDL).

Research importance:

The importance of the research lies in its demonstration of the seriousness of corruption on the tourism sector and the severity of its impact on corruption, this gives the decision maker a better vision of the extension of the impact of corruption to this vital sector, which if exploited would become a major resource after oil to supplement the government's general budget, the importance of the research lies in that is an opening for further research and investigation.

Requirement one: The theoretical framework of corruption and tourism investment

First: The concept of corruption:

Transparency International Organization defines corruption as the misuse of public authority or public office for the purpose of direct or indirect private gain for personal purposes based on patronage [(1)]. The 2003 United Nations Convention against Corruption also defined corruption as cases in which actual practices on the ground translate into bribery in all its forms, embezzlement of all kinds, as well as abuse of employment, money laundering, as well as illicit enrichment and other aspects of corruption [(2)]. Corruption is the exploitation of public job and public resources to achieve personal or collective benefits in accordance with Sharia law and official regulations, whether this exploitation is motivated by the personal motive of the employee himself or pressure from others outside the government apparatus, whether that is individual or collective behavior [(3)].

Second: Tourism investment:

Tourism investment is defined as that economic activity aimed at developing the tourism sector through investment in tourist facilities, services, facilities and tourism resources, with the aim of attracting tourists, providing distinguished tourism services and achieving high economic returns for investors and society in general [(4)]. Tourism investment is also defined as that part of the immediate

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productive capacity directed to the formation of physical and human tourism capital in order to increase the country's tourism capacity, such as building hotels and tourist cities., universities, tourism institutes, central structures that support tourism, and others [(5)]. In addition, others consider that tourism investment is the use of available material and human resources with the aim of activating all activities of the tourism sector to contribute to generating and increasing capital for the sector by adding to the country's national income [(6)].

Third: The impact of corruption on investment:

Corruption reduces project profits, which leads to reduced investment incentives, given that the many corruption payments represent a burden on any investment project and increase its costs, some researchers consider that corruption payments are a harmful tax imposed on investment because they target private interests, and the field study conducted by the World Bank in (The 1997 World Development Report) states that corruption is a problem generally facing investors, and that there is an inverse relationship between corruption and investment in any economy, the higher rates of corruption, the levels of investment decreased , if corruption rates decreased as investment levels increased. In addition, one study indicates that reducing corruption by (30%) will lead to an increase in the investment rate (50%). In addition, another study shows that there is a fixed relationship between corruption and investment, as increasing the corruption perceptions index from (4) to (6) will lead to an increase in investment at a rate of (4%), as well as an increase in the growth rate of personal income about (5%), which means that corruption can significantly and effectively affect the economic growth of any country through the investment channel [(7)].

Requirement two: Estimating the impact of corruption on tourism investment in Iraq for the period (2003 - 2021)

First: Description of the model:

The NARDL model was estimated by dividing the corruption variable (the Corruption Perceptions Index (CPI)) into positive and negative as follows:

$$\mathbf{CPI^{-}\ CPI^{+} + CPI_t = CPI_0 +}$$

Since:

$$\mathbf{CPI^{+}} = \sum_{j=1}^{t} \quad \mathbf{\Delta\, CPI^{+}} = \sum_{j=1}^{t} \quad max\ (\mathbf{\Delta\, CPI_j\ ,0})$$

$$\mathbf{CPI^{-}} = \sum_{j=1}^{t} \quad \mathbf{\Delta\, CPI^{-}} = \sum_{j=1}^{t} \quad min\ (\mathbf{\Delta\, CPI_j\ ,0})$$

Based on this assumption, we have a $NARDL_{(p,q)}$ model as follows:

$$TI_t = \sum_{j=1}^{p} \quad \phi_j\, TI_{t-j} + \sum_{j=0}^{q} \quad (\theta_{j=0}^{+} CPI_{t-j}^{+} + \theta_j^{-} CPI_{t-j}^{-}) + \varepsilon_t \ \ldots\ldots\ldots\ldots\mathbf{(1)}$$

Since:
TI_t :: Tourism investment.
CPI_t^+: An increase in the corruption perceptions index.
CPI_t^-: Decrease in the corruption perceptions index.

Equation (1) above refers to the short-term formula for describing the NARDL model, whose parameters must be stable and free from serial correlation problems and lack of variation stability, as well as the non-normal distribution.

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$$\Delta TI_t = \rho\xi_{t-1} + \sum_{j=1}^{\rho-1} U_j \, \Delta TI_{t-j} + \sum_{j=0}^{q-1} (\varphi_j^+ \Delta CPI_{t-j}^+ + \varphi_j^- \Delta CPI_{t-j}^-) \quad \text{……..(2)}$$

Since:

ξ_{t-1}: Limit error correction.

ρ : The speed of error correction.

The error correction limit must be negative and significant, in addition to the error correction speed must be between (-1) and (0).

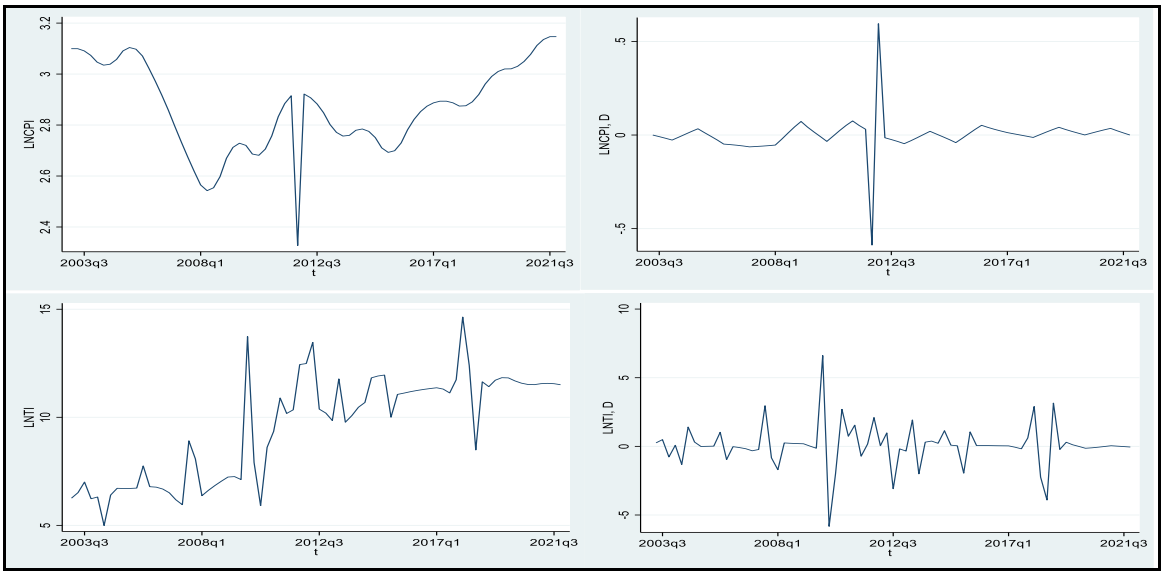
$$\Delta TI_t = \rho TI_{t-1} + \theta^+ CPI_{t-1}^+ + \theta^- CPI_{t-1}^- + \sum_{i=1}^{p-1} U_i \, \Delta OMS_{t-i} + \sum_{i=0}^{q-1} \pi_i \, \Delta CPI_{t-i} \quad \text{……(3)}$$

Equation (3) above shows the formula of the long-run NARDL model

Second: Specifying the model data:

We used tourism investment data in Iraq (TI) in billion Iraqi dinars and at current prices, and the Corruption Perceptions Index as a corruption indicator (CPI), and the researcher converted the annual data into quarterly data [(*)] (quarterly) for the period (2003.Q1-2021.Q4). This is done using the Litterman method and taking the natural logarithm form, so the number of views is (76). Figure (1) below shows the data of the standard search form as follows:

Figure (1): Tourism Investment (TI) and the Corruption Perceptions Index (CPI) in Iraq for the period (2003.Q1-2021.Q4).



Source: From the work of the researcher based on the statistical program (STATA 17).

[*] The data was converted from annual to quarterly (quarterly) due to the small number of observations (19), for which it is not possible to use unit root tests, in addition to the fact that the NARDL model takes A large number of time lags, which reduces the degrees of freedom, making the results of model is biased.

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Third: Unit root test:

Stasis is one of the important topics to avoid the phenomenon of spurious regression. Stasis in time series means that the mean and variance of the series, as well as its variance, are constant over time. We can infer this through the Extended Dickey-Fuller and Phillips-Perron tests (ADF, PP), respectively, from which it is noted, as in Table (1), the following:

Table (1): Unit root tests for tourism investment (TI) and the Corruption Perceptions Index (CPI) in Iraq for the period (2003.Q1-2021.Q4).

	(Level) *				1st difference			
Variables / Tests	LnTI		LnCPI		LnTI		LnCPI	
	T – Statistic	Prob	T – Statistic	Prob	T – Statistic	Prob	T – Statistic	Prob
ADF	-2.344	0.158	-1.674	0.445	-10.228	0.000	-8.096	0.000
PP	-2.598	0.0934	-2.233	0.194	-14.517	0.000	-13.628	0.000

Source: From the work of the researcher based on the statistical program (STATA 17).

Table (1) above shows that the two time series for the variables of corruption (LnCPI) and tourism investment (LnTI) are constant at the first difference [I(1)], through a value (P – Value) of less than (5%), and thus accepting the alternative hypothesis by stasis time series and rejecting the null hypothesis.

Fourth: Estimating the NARDL model:

The results of estimating NARDL model in Table (2) below indicate the existence of a long-term non-linear equilibrium relationship between corruption and tourism investment in Iraq. The F-Bounds Test confirms that the value is (219.3) and its P-value is (0.000), which is less than (5%), which means rejecting the null hypothesis and accepting the alternative hypothesis. When the corruption perceptions index increases, corruption rates decreased by a percentage (1%) will lead to an increase in tourism investment in Iraq by (1.77%), while a decrease in the Corruption Perceptions Index (increase in corruption rates) by (1%) will lead to a decrease in tourism investment in Iraq by (1.69%), and if any imbalance occurs in this relationship in the short term to the long term equilibrium, the error correction model will restore balance quickly (-1.0628), which means that (106.28%) of the imbalance in the shock of the last quarter will be corrected in the current quarter.

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Table (2): NARDL model estimation results

Source	SS	df	MS	Number of obs =	74
				F(8, 65) =	8.71
Model	93.1165077	8	11.6395635	Prob > F =	0.0000
Residual	86.905527	65	1.33700811	R-squared =	0.5173
				Adj R-squared =	0.4578
Total	180.022035	73	2.46605527	Root MSE =	1.1563

_dy	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
_y						
L1.	-1.062816	.1545382	-6.88	0.000	-1.37145	-.7541822
_x1p						
L1.	1.882113	.9526789	1.98	0.052	-.0205178	3.784745
_x1n						
L1.	-1.800149	.9225133	-1.95	0.055	-3.642535	.0422377
_dy						
L1.	.1910499	.1180906	1.62	0.111	-.0447933	.426893
_dx1p						
--.	9.671436	4.658889	2.08	0.042	.3669921	18.97588
L1.	5.169343	2.036845	2.54	0.014	1.101483	9.237204
_dx1n						
--.	-6.860433	2.069032	-3.32	0.001	-10.99257	-2.728292
L1.	5.244217	4.744941	1.11	0.273	-4.232086	14.72052
_cons	6.7326	1.019543	6.60	0.000	4.696432	8.768767

Asymmetry statistics:

	Long-run effect [+]			Long-run effect [-]		
Exog. var.	coef.	F-stat	P>F	coef.	F-stat	P>F
lncpi	1.771	4.439	0.039	1.694	4.064	0.048

	Long-run asymmetry		Short-run asymmetry	
	F-stat	P>F	F-stat	P>F
lncpi	219.3	0.000	17.25	0.000

Note: Long-run effect [-] refers to a permanent change in exog. var. by -1

Cointegration test statistics: t_BDM = -6.8774
F_PSS = 16.1336

Model diagnostics	stat.	p-value
Portmanteau test up to lag 35 (chi2)	29.84	0.7156
Breusch/Pagan heteroskedasticity test (chi2)	.4822	0.4874
Ramsey RESET test (F)	.6714	0.5728
Jarque-Bera test on normality (chi2)	342.1	0.0000

Source: From the work of the researcher based on the statistical program (STATA 17).

As Table (2) above shows, the estimated model is statistically acceptable through testing the (F) statistic, which has a value of (8.71), and its (P – Value) value (0.000), which is less than (5%), and therefore accepting the alternative hypothesis according to the significance of the estimated model as a whole and rejecting the null hypothesis, and the rest of the estimated model does not suffer from the problem of serial correlation as shown by the (Portmanteau) test, where the value of (chi2) for it is (0.7156), which is greater than (5%), which means accepting the null hypothesis and rejecting the alternative hypothesis, as well It is noted from the results that the rest of the estimated model is free of the problem of non-stability of variance, as confirmed by the (Breusch – Pagan – Godfrey) test, where the value of (chi2) is (0.4874), which is greater than (5%), which means accepting the null hypothesis and rejecting the alternative hypothesis, while the rest of the model is not normally

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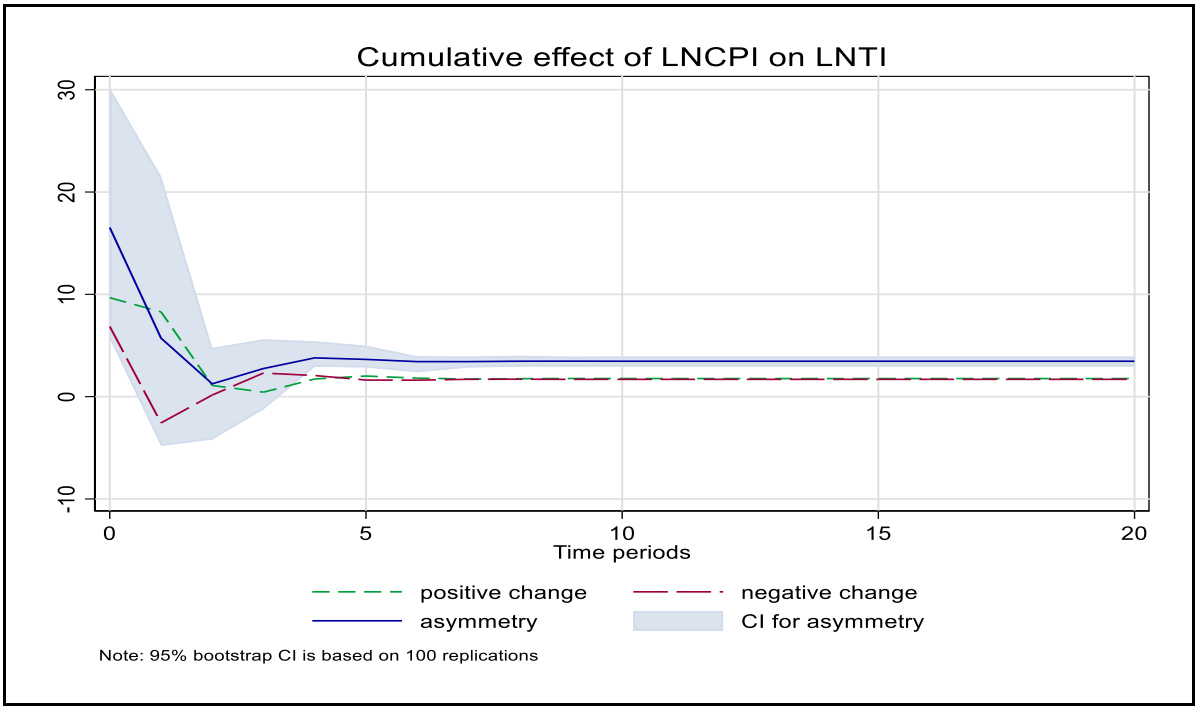
distributed, as shown by the Jarque-Bera test, as the value of (chi2) is (0.000), which means rejecting the null hypothesis and accepting the alternative hypothesis, the estimated NARDL model for the relationship between corruption and tourism investment in Iraq is a good description as it proves by Ramsey test (Ramsey Regression Equation Specification Error Test), where the statistical value of the F test is (0.6714) and the statistical value (P-value) is (0.5728), which is greater than (5%), which requires rejecting the null hypothesis and accepting the alternative hypothesis , that the estimated NARDL model does not suffer from the problem of mischaracterization.

Fifth: Estimating the dynamic multipliers:

It is clear from Figure (2) below that a shock in corruption will lead to an increase in tourism investment to about (17%), but this percentage will soon decrease and continue to decline, reaching its peak after about two semesters (six months) to about (1%). Starting from the third semester, it will increase to reach its peak in the fourth semester, about one year after the shock, at about (3%). This increase will continue in the long term, even after about five years, without returning to the equilibrium position that it was in before the shock occurred.

Figure (2): The dynamic multipliers of the impact of the Corruption Perceptions Index on tourism investment in Iraq



Source: From the work of the researcher based on the statistical program (STATA 17).

Conclusions:

1. The existence of a long-term non-linear inverse relationship between corruption and tourism investment in Iraq.
2. Increasing the Corruption Perceptions Index (decreasing corruption rates) by a certain percentage will lead to an increase in tourism investment in Iraq by (177%) of that percentage, while decreasing the Corruption Perceptions Index (increasing corruption rates) by a certain percentage will lead to a decrease in tourism investment in Iraq by a percentage. (169%) of that percentage.

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3. When any short-term imbalance occurs in the long-term balance, the automatic correction force in the economy will quickly restore balance (-1.0628), meaning that (106.28%) of the imbalance in the last semester's shock will be corrected in the current semester.
4. A shock in corruption will lead to an increase in tourism investment to about (17%), but this percentage will soon decrease and continue to decline, reaching its peak after about two semesters (six months) to about (1%), and starting from the third semester, it will increase to reach Its peak is in the fourth semester, about one year after the shock, at about (3%), and this increase continues in the long term, even after about five years, without returning to the equilibrium position that it was in before the shock occurred.

Recommendations:

1. Improving the investment environment in Iraq and providing support and facilities to investors in the tourism sector, by facilitating administrative procedures and reducing bureaucracy, improving infrastructure and logistics services related to tourism, and reducing costs and taxes on tourism investments.
2. Strengthening the partnership between the public and private sectors in the field of tourism development, by encouraging foreign and local investors to invest in the tourism sector and providing them with the necessary support and facilities.
3. Improving worker training and qualification by providing the necessary training and qualification courses for workers in this field, and encouraging educational institutions to provide specialized educational programs in the field of tourism.
4. Developing tourism products, organizing various tourism events, and marketing them well to attract more tourists.
5. Strengthening government administration in the field of tourism, by developing strategic plans and administrative procedures related to tourism, and updating them periodically to meet market needs and improve the sector's performance.

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