

**The impact of tourism investments on economic growth in Egypt
An econometric study using ARDL**

أثر الاستثمارات السياحية على النمو الاقتصادي في مصر

دراسة قياسية باستخدام نموذج ARDL

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Abstract

This work aims to highlight the role played by investment in the tourism sector in achieving economic growth in the State of Egypt, by conducting an econometric study using the autoregressive model of slowing time gaps.

The results of the study concluded that there are positive and significant impact of INVESTOURISM tourism investment on the GDP growth rate, while the other independent variables represented in each of the inflation rate INF and the exchange rate EXCH have negative effect.

Keywords: Investment in the tourism sector; Economic growth; Inflation rate; Exchange rate

JEL Classification Codes : H54, O4, C32, E31

ملخص:

يهدف هذا العمل لإبراز الدور الذي يلعبه الاستثمار في القطاع السياحي في تحقيق النمو الاقتصادي في دولة مصر من خلال إجراء دراسة قياسية باستخدام نموذج الانحدار الذاتي للفجوات الزمنية المبطنة.

توصلت نتائج الدراسة لوجود أثر إيجابي ومعنوي للاستثمار السياحي INVESTOURISM على معدل النمو GDP بينما المتغيرات المستقلة الأخرى والمتمثلة في كل من معدل التضخم INE وسعر الصرف EXCH فلها أثر سلبي.

كلمات مفتاحية: الاستثمار في القطاع السياحي، النمو الاقتصادي، معدل التضخم، سعر الصرف

تصنيفات JEL : H54, O4, C32, E31

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Introduction:

The tourism sector is very important for any country because of its positive impact on building and advancing the economy. Therefore, tourism in Egypt is one of the main sources of national income as being one of the most important factors for development and prosperity in the country, due to its role in earning hard foreign currencies and providing a large number of job opportunities for individuals, as the number of jobs in the tourism sector is estimated at approximately 4.5 million jobs, or 13% of the workforce in the country.

The increasing significant role that tourism plays in economic development issues in developing and developed countries alike, and this was reflected in the intense interest on the part of the governments of many countries in the tourism sector, and that interest was represented in encouraging foreign investments (12), as the state believes in the importance of The role of the tourism sector Considering that tourism projects are one of the most attractive service projects for local and foreign capital, it has paid more attention to the private sector and encouraged it to invest in tourism activity by facilitating many procedures for Egyptian and foreign investors to increase their investments in tourism activity.

• **The main problem:**

Based on the above, the following main question can be asked:

To what extent does investment spending in the tourism sector contribute to the GDP in Egypt?

• **The importance of studying:**

The importance of the topic lies in:

- Addressing the reality of the tourism sector in Egypt
- Studying the impact of the tourism sector on growth in Egypt through the standard study.

• **Previous studies of the impact of the tourism sector on economic growth:**

There are many studies that have dealt with the relationship between the tourism sector and the extent of its contribution to raising the gross domestic product and thus economic growth rates. They can be summarized as follows:

- A study (Zortuk, Economic impact of tourism on turkey's economy: Evidence from cointegration tests, 2009)MahmutZortuk, entitled Economic impact of tourism on turkey; Evidence from co integration test, which is an article published in the International Research of Finance and Economics magazine, and the researcher tried to research the development of the tourism sector in Turkey during the period from The first semester of 1990 until the third semester of 2008. Using the causality test, the researcher used a standard model based on each of the exchange rate and the number of tourist arrivals as independent variables and the per capita domestic product as the dependent variable.

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The results of the study found that there is a long-term equilibrium relationship between the GDP (Gdp) and the number of incoming tourists, and it also found that there is an indirect causal relationship between the variables of tourism to the GDP in Turkey during the same period.

- Study (MALLICK, Ummalla, & BEHER, 2016) Lingaraj MALLICK, Ummalla MALLESH entitled ? Does tourism affect economic growth in Indian states,

The study examines the relationship between tourism and economic growth in 23 Indian states from 1997 to 2011 on three alternative estimators such as estimated group mean (MG), pooled mean group (PMG) and dynamic fixed effects (DFE). Economic growth is in the long run while there is no in the short run in India.

- A study (Taizeng, Muhlis, Sudhar, Reddy, & Jianchun, 2019) Taizeng Ren titled The Impact of Tourism Quality on Economic Development and Environment: Evidence from Mediterranean Countries. Economic and environmental pollution in a sample of eight Mediterranean countries, during the period 1995-2014, using the ARDL model and causality test.

- Practical results showed that the income level of tourist arrivals to a country, across all quantities, plays an important role in promoting economic development. However, the role of a country's tourist arrival income level on environmental pollution varies with different quantities. More specifically, a country's level of tourist arrival income has a positive effect on environmental pollution for lower quantities, while it has a negative effect on higher quantities.

- Bichaka Fayissa, Christian Nsiah (Bichaka, Christian, & Badassa, 2007) study entitled The Impact of Tourism on Economic Growth and Development in Africa, the researcher conducted an econometric study using the Panel model during the period 1995-2004, this study attempts to explore the potential contribution of tourism in economic growth and development within the neoclassical framework,

- The results show that tourism industry revenues contribute significantly to both the current level of GDP and the economic growth of sub-Saharan African countries. The researcher concluded that African economies can enhance their economic growth in the short term by strategically promoting their tourism industries.

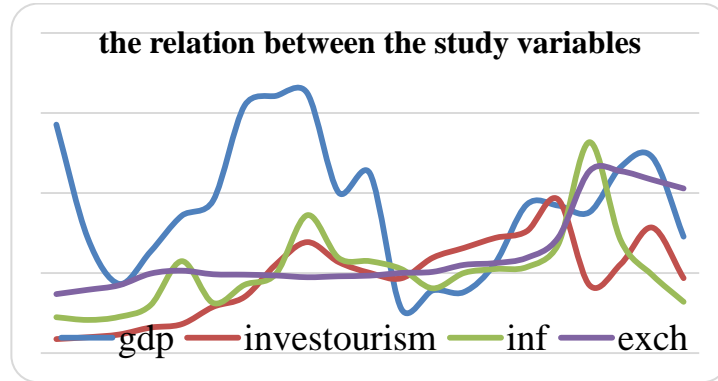
1- The evolution of the model variables during the study period:

1-1 Growth rate:

The economic and social development plan for the year 21/22 showed the gradual economic growth rates in Egypt during the recent period, as well as the effects of the Corona pandemic on it, and although the global crisis affected many countries' economies, Egypt succeeded in withstanding the pandemic and achieved very good growth rates, To the extent that international economic institutions indicated that Egypt is the only country in the region that

achieves positive growth rates in this way, despite the global crisis, as it reached a rate of 5.1% in 2010 and 5.55% in 2019.

Figure 1: Graphical representation of the study variables



Source: Prepared by the researcher based on data from the World Bank

1-2 Inflation rate:

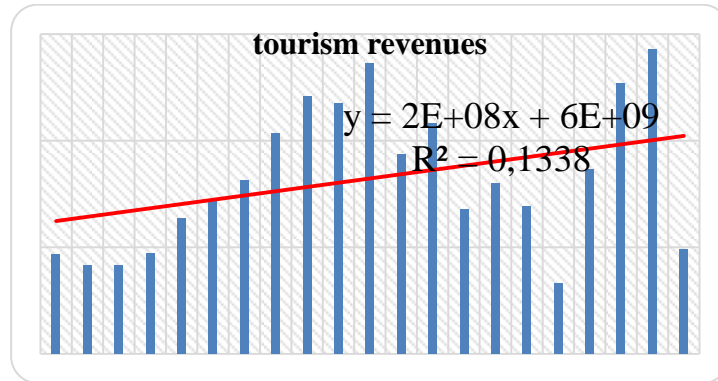
- As for the inflation rate, it was 23.5% in 2016/2017, 2015/2016, 2014/2015, 10.14 in 2013/2014, 6.9% in 2012/2013, and 8% in 2012/2013. 6% in 2011/2012. The reason for the rise is due to the rise in commodities, especially in the Corona period, amid the cessation of production in some large countries, in addition to the resort of some countries to stockpiling as a result of fears of increases or decreases in production during successive waves of the virus, and this was reflected in commodity prices in Egypt.
- The tourism sector (Mohamed Abdel (2021، محمد عبد الحميد،) is considered one of the important economic sectors in Egypt, which played a prominent role in improving foreign exchange earnings, whether in exports or in the balance of payments, as it is one of the main sectors that generate the most foreign exchange in Egypt.

1-3- Tourism investments in Egypt:

- It is evident from Figure 1, which shows the development of public and private investments in the tourism sector, as it reached its highest value in 2016, a value of 4.3 billion dollars, then it declined to 2.57 billion dollars in 2020 due to the repercussions of Corona. Egypt achieved the highest tourism revenues in its history during the year 2019, exceeding \$13.03 billion (Figure 2), and was visited by 13.1 million tourists this year.

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Figure 2: Tourism revenues for Egypt during the period 2000-2020



Source: Prepared by the researcher based on data from the World Bank

1-4 Exchange rate:

In 2001, the value of the Egyptian pound was reduced to about 3.86 pounds, then it was reduced again to 4.15 pounds, due to many internal and external events that affected the exchange rate, such as the events of September 11, which affected many sectors of the Egyptian economy, such as the tourism sector and investments.

And with the repercussions of the January 2011 revolution, which (محمد رجب، منار باسم، 2022) negatively affected the Egyptian economy through a significant decrease in foreign reserves (Egypt lost 21 billion dollars) and the depreciation of the pound against the dollar to reach 5.99 pounds per dollar by the end of 2011, then to 6.89 pounds per dollar. In 2013 (Figure 1), according to Central Bank reports, there were also waves of decline in the volume of foreign currency cash reserves as an inevitable result of the state of political and economic instability in Egypt. The cash reserves reached about 15 billion in 2014.

2 - Standard study:

In order to study the impact of tourism on the GDP in Egypt, a standard model was used during the period 1995-2018 according to the following:

- Determine the model used .
- Descriptive analysis of model variables .
- Studying the nature of the relationship between GDP and the independent variables .
- Testing the stability of the variables .
- Test the degree of integration of variables .
- Determine the slowdown period for the ARDL model .
- Estimating the ARDL model .
- Determine the model used.

The form has been formulated as follows:

$$\text{GDP} = f(\text{INVESTOURISM}, \text{INF}, \text{EXCH})$$

Table 1 defines the variables involved in forming the model

Table 1. Definition of study variables

the source	measruing unit	the symbol	Variables
The World Bank	Growth of GDP (annual %)	GDP	The rate of growth of the domestic product
The World Bank	International tourism, expenditure (current US\$)	INESTOURISM	Investment in the tourism sector
The World Bank	Inflation, consumer prices (annual %)	INF	Inflation rate
The World Bank	Official exchange rate (local currency units per US\$, average for the period)	EXCH	exchange rate

Source: Prepared by the researcher

2-1 The nature of the relationship between the dependent and independent variables :

Converting the variables into standard values ($z = \frac{Xi - mediane}{ecart - type}$) aims to standardize the units of the variables so that they are homogeneous (some variables are percentages, billions of dollars...), and in order to ascertain the nature of the relationship between the dependent variable and other independent variables, the RAMSEY test was performed according to Table 2 below.

Table 2. Nature of the relationship between the dependent and independent variables

ovtest
Ramsey RESET test using powers of the fitted values of gdp
Ho: model has no omitted variables
F(3, 15) = 0.91
>0.05Prob > F = 0.4616

Source: Prepared by the researcher based on the output of Stata15

Through the **RAMSEY** test shown in Table 2, we note that the probability of Fisher Prob $F = 0.4616 > 0.05$, this indicates that the relationship between the growth rate (dependent variable) and the independent variables is linear and therefore there is no need to convert the variables into logarithms.

2-2 Descriptive analysis of the variables:

The descriptive analysis of the study variables represented in each of the growth rate as a percentage as a dependent variable in addition to each degree of trade openness (the average

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of total exports and imports in relation to the GDP) and foreign direct and fixed investment. Capital formation as independent variables and the results are shown in Table 3.

Table 3. Descriptive statistics of the study variables

	GDP	INVESTOURISM	INF	EXCH
Mean	4.352144	2.61E+09	9.793052	8.070063
Median	4.346643	2.70E+09	9.469720	5.932828
Maximum	7.156284	4.35E+09	29.50661	17.78253
Minimum	1.764572	1.21E+09	2.269757	3.472050
Std. Dev.	1.632438	9.01E+08	6.130214	4.654475
Skewness	0.225741	-0.079764	1.538480	1.326526
Kurtosis	2.109473	2.105089	6.216877	3.150828
Jarque-Bera	0.872266	0.723026	17.33898	6.178751
Probability	0.646532	0.696622	0.000172	0.045530
Sum	91.39502	5.47E+10	205.6541	169.4713
Sum Sq. Dev.	53.29704	1.62E+19	751.5906	433.2828
Observations	21	21	21	21

Source: Prepared by the researcher based on the outputs of Eviews 10.

Through the results of Table 4, it can be seen that the highest growth rate in Egypt during the study period amounted to 7.15% in 2008, the lowest was 1.76% in 2011 due to security repercussions during that year.

As for the inflation rate, the highest rate was recorded in 2017 at a rate of 29.50% (Table 3), and the lowest rate was 2.29%, and that was in 2001.

As for investment spending in the tourism sector, it recorded the largest value in 2016 at \$4.35 billion.

Considering the value of skewness and Kurtosis coefficients, as well as the probability of Jarque-Bera <0.05, all variables follow a normal distribution.

2-3 The stability of the study variables:

(Belloumi) stability test is intended to ensure that the degree of integration of variables is not I(2) and this is to avoid errors in estimation, and the presence of integration of variables of degree 2 does not allow us to interpret the results of the F-stat test generated by (Hashem,

Yongcheol and Richard). After performing the stability test, the results can be summarized in the following Table 4:

Table 4. Stability of Variables Study Using the Phillip-Peroon Test

UNIT ROOT TEST TABLE (PP)					
	<u>At Level</u>				
		GDP	INVESTOURISM	INF	EXCH
With Constant	t-Statistic	-2.6018	-1.9574	-2.6739	-0.3330
	<i>Prob.</i>	<i>0.1090</i>	<i>0.3015</i>	<i>0.0959</i>	<i>0.9033</i>
	Decision	n0	n0	*	n0
With Constant & Trend	t-Statistic	-2.5324	-2.3113	-2.6990	-1.4422
	<i>Prob.</i>	<i>0.3108</i>	<i>0.4097</i>	<i>0.2469</i>	<i>0.8152</i>
	Decision	n0	n0	n0	n0
Without Constant & Trend	t-Statistic	-1.1881	0.0405	-1.0930	0.9235
	<i>Prob.</i>	<i>0.2065</i>	<i>0.6841</i>	<i>0.2390</i>	<i>0.8983</i>
	Decision	n0	n0	n0	n0
	At First Difference				
		d(GDP)	d(INVESTOURISM)	d(INF)	d(EXCH)
With Constant	t-Statistic	-4.2491	-5.7404	-5.3587	-3.1672
	<i>Prob.</i>	<i>0.0042</i>	<i>0.0002</i>	<i>0.0004</i>	<i>0.0383</i>
	Decision	***	***	***	**
With Constant & Trend	t-Statistic	-3.9607	-11.2529	-5.7000	-2.9548
	<i>Prob.</i>	<i>0.0295</i>	<i>0.0000</i>	<i>0.0011</i>	<i>0.1690</i>
	Decision	**	***	***	n0
Without Constant & Trend	t-Statistic	-4.3728	-5.4435	-5.5180	-3.0637
	<i>Prob.</i>	<i>0.0002</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0042</i>
	Decision	***	***	***	***

Source: Prepared by the researcher based on the outputs of Eviews 10.

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From the results of Table 4, it can be noted that:

Both the dependent variable (growth rate) and the independent variables (tourism investment, inflation rate, exchange rate) are unstable in level, but they stabilize after making the first difference, after conducting the Phillip-Peroon test, which indicates that the study variables are integrated of degree 1 (Table 5) .

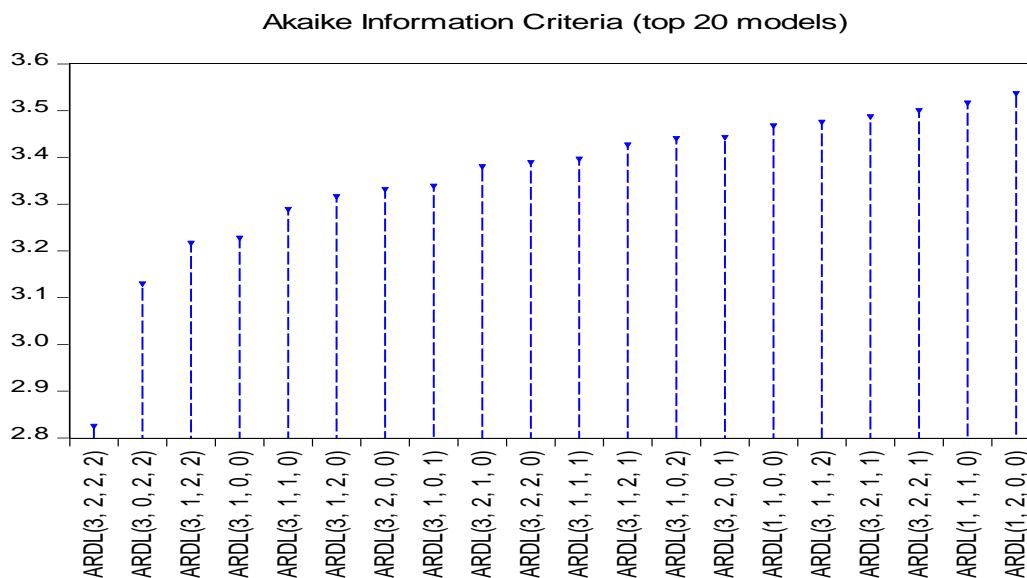
Table 5. The degree of integration of the variables

Degree of integration of variables	Stability in the first difference	stability in the level	
I(1)	stable	unstable	GDP growth rate
I(1)	stable	unstable	Investment in the tourism sector
I(1)	stable	unstable	Inflation rate
I(1)	stable	unstable	exchange rate

2-4 Optimal idle period:

As long as the independent variables are a combination of stability between the level and the dependent variable I (1), w can (Emeka and Aham) model ARDL, but before that we must determine the delay period for each variable and the results by testing different models for ardl according to the delay values for each from the dependent variable max lag y and the independent variables max lag x.

Figure 3. The deceleration period for the variables



Source: Prepared by the researcher based on the outputs of Eviews 10.

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According to the results of Figure 3, the lowest value of akaike criterion = 2.83, which is consistent with the Ardl (3.2.2.2) model.

2-5 ARDL model estimation (3.2.2.2) :

After determining the slowdown period distributed among the variables of the study, we now estimate the autoregressive model for the distributed gaps through the following Table 6:

Table 6. Model estimation using ARDL (3.2.2.2)

Dependent Variable: GDP				
Method: ARDL				
Date: 11/17/22 Time: 22:13				
Sample (adjusted): 2003 2020				
Included observations: 18 after adjustments				
Maximum dependent lags: 3 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (2 lags, automatic): INVESTOURISM INF EXCH				
Fixed regressors: C				
Number of models evaluated: 81				
Selected Model: ARDL(3, 2, 2, 2)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP(-1)	1.202184	0.334930	3.589361	0.0157
GDP(-2)	0.525140	0.278786	1.883668	0.1183
GDP(-3)	-0.745107	0.217125	-3.431690	0.0186
INVESTOURISM	5.99E-11	6.10E-10	0.098081	0.9257
INVESTOURISM(-1)	3.17E-09	2.11E-09	1.499281	0.1941
INVESTOURISM(-2)	-2.88E-09	1.60E-09	-1.807271	0.1305
INF	-0.330226	0.193608	-1.705644	0.1488
INF(-1)	-0.304337	0.129541	-2.349338	0.0656
INF(-2)	-0.328682	0.124585	-2.638218	0.0461
EXCH	0.064134	0.284901	0.225110	0.8308
EXCH(-1)	-1.950801	0.851981	-2.289724	0.0707
EXCH(-2)	-2.527513	1.033829	-2.444808	0.0583
C	4.635612	1.543449	3.003411	0.0300
R-squared	0.906177	Meandependent var		4.394420
Adjusted R-squared	0.681000	S.D. dependent var		1.621122
S.E. of regression	0.915610	Akaike info criterion		2.825059
Sum squared resid	4.191713	Schwarz criterion		3.468105
Log likelihood	-12.42553	Hannan-Quinn criter.		2.913727
F-statistic	4.024298	Durbin-Watson stat		3.008553
Prob(F-statistic)	0.037391			

Source: Prepared by the researcher based on the outputs of Eviews 10.

From the results of Table 6, it can be noted that:

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- The optimal deceleration period is distributed between Lag = 3 for the dependent variable (growth rate) and Lag = 2 for the rest of the variables.
- The growth rate for the previous period (GDP -1) has a positive and significant impact on the current growth rate (GDP) and this is consistent with economic theory, as achieving growth in the gross domestic product during the past year positively affects the following year.
- INVESTOURISM has a positive impact on economic growth in Egypt, as more tourism investments are needed to stimulate economic growth and create more direct and indirect job opportunities in the tourism sector, given that the tourism sector plays a prominent role in the economies of many countries of the world. It is considered an important source of national income, and there are many countries that have been able to achieve high growth rates of tourism output, and Egypt is one of them.
- The inflation rate has a negative and significant effect on the growth rate in Egypt, as an increase in inflation rates by one unit leads to a decrease in growth rates by 0.32 units, which is consistent with (بوحيدر، 2021), usually inflation affects growth rates adversely through the decrease in the purchasing power of the consumer, the inflation of production costs, and the decline in profits, which leads to a decline in production.
- With regard to the exchange rate, and through the results of estimating the ARDL model (3.2.2.2), we recorded a negative relationship, as the rise in the exchange rate (the Central Bank of Egypt's floating of the pound), which leads to a decrease in local exports of goods and services due to the reduction in the competitiveness of locally produced commodities, And the rise in imports because the prices of imports have become more attractive to citizens. It has been negatively affecting the trade balance and the domestic product in particular.
- Correlation coefficient $R^2 = 0.90$, meaning that the independent variables explain the dependent variable (growth rate) by 90%.
- Potential F-Statistic = $0.037 < 0.05$ indicates that the model has overall significance.
The value of the Derbin-Watson coefficient $DW = 3.00$ means that the errors are not related to each other.

Conclusion:

The study aimed to test the impact of tourism investment on GDP growth in Egypt during the period 2000-2020, using the ARDL model.

The results of the study concluded that there is a positive relationship between tourism investment and growth, as more tourism investments are needed to stimulate economic growth, and create more direct and indirect job opportunities in the tourism sector, since the tourism sector plays a prominent role in the economies of many countries of the world. It is an important source of national income. Also, both the inflation rate and the exchange rate negatively affect the growth rate in Egypt.

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