

Econometric Analysis of the Relationship Between Tourism Revenues, Inflation and Economic Growth: The Case of Morocco and South Africa

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Abstract

The aim of this study is to determine the relationship between international tourism revenues, inflation rates and economic growth of Morocco and South Africa between. The Multiple Linear Regression Model was used to measure whether there is a significant relationship between dependent and independent variables and how the variables affect economic growth. The data used in the analysis were obtained from the World Bank and include annual data. During the analysis process, a series of assumption tests were made to reveal the significance of the model. The model was established by taking the logarithm of the dependent variable. The VIF test was used to measure that the independent variables were not related to each other, the Breusch-Godfrey LM test was applied to examine whether there was autocorrelation between the error terms, and the Shapiro-Wilk W test, which was another assumption, was applied to measure the normal distribution of the error terms. As a result of the latest multiple linear regression analysis, it was determined that there was a significant relationship between the variables of both countries. In both countries, the increase in international tourism revenues affects economic growth positively, but the increase in inflation affects economic growth negatively.

Keywords: GDP; tourism; economic growth; inflation

Introduction

Economic growth is an important factor in the development of a country, ensuring its international recognition and increasing the welfare of the country (Acemoglu, 2012). Ensuring economic growth is among the main goals that every country wants to achieve. For this reason, economic growth is affected by a number of factors, either positively or negatively. Tourism over the years has proven to be a surprisingly strong and resilient economic activity and a fundamental contributor to economic growth of nations by generating billions of dollars in exports and creating millions of jobs (Samimi et al., 2011; Ghali, 1976; Gwenhure & Odhiambo, 2017). A number of studies that have been done or are still being conducted in the literature are also capable of determining the relationship and direction of economic growth and a number of factors. Factors such as income from international tourism, foreign exchange reserve structure, inflation rates, and the country's position at the international level can be given as examples.

There are several methods for increasing the foreign exchange reserves, which is one of the most important indicators, such as increasing the amount of exports, attracting foreign investors to invest in the country and increasing the number of foreign tourists. Tang and Abosedra (2016) concluded that there is a significant relationship between tourism revenues and economic growth and tourism supports economic growth as a result of their study on Morocco and Tunisia. Bouzahzah & Menyari (2013) also revealed in their study on Morocco and Tunisia that tourism revenues will positively affect economic growth. As a result of Menyari's (2021) study only on Morocco, it was concluded that there is a significant relationship between tourism revenues and economic growth. In Phiri's (2016) study on South

Africa, it was concluded that there is a significant bidirectional relationship between tourism revenues and economic growth. Akinboade & Braimoh (2020) found a significant relationship between economic growth and tourism revenues as a result of their study on South Africa.

The relationship between tourism and economic growth has been studied by different researchers for different countries. Balaguer & Cantavella-Jorda (2002) for Spain, Dritsakis (2004) for Greece, Oh (2005) for Korea, Gunduz & Hatemi (2005) for Turkey have also found empirical support for the tourism-led growth hypothesis. However, the relationship between tourism and economic growth for some African countries is also discussed. In our study, the relationship between tourism and economic growth was examined on the basis of data from two African countries. Inflation is added to these variables. This further increases the original value of the work. While Cunado & Garcia (2006) also find some evidence of conditional convergence toward the African regional average (for Benin, Cameroon, Cape Verde, Djibouti, Egypt, Ghana, Kenya, Mali, Uganda, and Zimbabwe) and the U.S. (for Cape Verde, Egypt, Mauritius, Seychelles, and Tunisia), the coverage given to the contribution of tourism has been scant.

The depreciation of a country's currency, that is, the inflation process, affects the purchasing power of other countries in that country. Therefore, a country experiencing inflation attracts an influx of tourists and accordingly tourism revenues increase. This indirectly shows the relationship between tourism revenues, inflation and economic growth. From this point of view, the relationship between these variables was tried to be measured in this study.

In this study, two countries were chosen from among the countries where the most foreign tourists come from in the North African region. Although there are studies on both Morocco and South Africa in the literature, there are very few articles on this subject. In addition, only tourism revenues were taken into account in the studies and the study included in the inflation rate is not included in the literature. From this point of view, the relationship between international tourism revenues and inflation rates of these countries and economic growth was investigated in this study. According to the findings obtained as a result of a series of assumption tests and multiple regression analysis, there is a relationship between economic growth, international tourism revenues and inflation in these countries. In both countries, the increase in international tourism revenues affects economic growth positively, but the increase in inflation affects economic growth negatively.

Theoretical background

Economic growth

Economic development and economic growth are the core issues of economic literature. Generally, both terms (economic development and economic growth) are used in expressing the idea of economic progress. But the economists draw distinction between the two terms. Based on Todaro (2006), "Economic growth is a steady process by which productive capacity of the economy increased over time to bring about rising level of national output and income". Economic growth represents the increase in the amount of final goods and services produced in a country in a given period. The concept of economic growth, which is also an expression of the increase in real income per capita, basically refers to the production capacity, which is related to the supply side of the economy defines long-term increases. These increases in production capacity are closely related to the development process in advanced technology and institutional structuring. Economic growth; per capita income, physical and human capital accumulation, technological development, demographic factors, geographical factors and climate, cultural or institutional factors, level of democracy, income distribution, government policies and macroeconomic stability, etc. It is affected directly by the relations with the factors and indirectly by the relations of these factors among themselves.

Inflation

For the hotel, entertainment and tourism industry, high inflation may harm the electric companies and cause higher losses and increase the operational costs. In case of low inflation, interest rates may fall and hence, it is not a benefit for investment portfolio. Hang et al. (2020) hence risk assessment and control mechanisms are necessary for them to reduce these losses. Inflation can be defined as a continuous increase in the general level of prices or a continuous decrease in the value of money. Gali & Gertler (1999) discussed there are a few issues with this definition. First, inflation refers to a movement in the general level of prices. It does not refer to a change in price relative to other prices. Second, the rise in the price level must be sustained over a period of one day, one week, or one month. When it comes to inflation, the first thing that comes to mind is the increase in the prices of goods and services that we use a lot in our daily life. However, the prices of goods and services can increase or decrease over time. Inflation is not simply an increase in the price of a particular good or service, but a continuous increase in the general level of prices.

Tourism

Tourism business development has been the focus of study in recent times. Lee & Chang (2008) state that a general consensus has emerged that it not only increases foreign exchange income, but also creates employment opportunities, stimulates the growth of the tourism industry and by virtue of this, triggers overall economic growth. Tourism is defined as the social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes. It is argued that the tourism sector, which has grown worldwide after the Second World War, is beneficial in terms of providing the necessary foreign exchange for the realization of investments that will ensure development, especially in developing countries. It is claimed that tourism, as a service sector, is an effective sector in reducing unemployment and income inequality with its employment-intensive structure. Steven et al. (2013) explained that, revenues related to tourism are evaluated as a separate item in national income accounts and tourism investments are measured specifically within the country-wide investments. In the national income accounting of countries, that is, in the balance of payments, holiday and business tourism expenditures, consumption and investment; foreign tourism revenues export. The foreign tourism expenditures of the people of the country are considered as imports.

The impact of tourism on economic growth and development

It can be said that the theoretical basis that the tourism sector will cause economic growth as a development strategy stems from the literature on exports and economic growth. With the increase in tourists coming to the country, the demand for product and service production in the visited country increases accordingly. If there are opportunities to increase the production to meet this demand with local resources, all expenditures of tourists will remain within the country. However, if local resources are not sufficient to provide this production increase, it will be necessary to import in order to supply the necessary production factors. According to Akan et al. (2007) as a result, if the touristic foreign exchange earnings of the country are more than the foreign exchange losses, tourism will contribute positively to the balance of payments.

The poverty reducing effect of tourism

The effects of tourism on income; It is explained in three ways as direct, indirect (secondary) and dynamic effects. If the effects on income are positive, it is thought that it will reduce poverty. The direct effects of tourism on poverty; workers' incomes and other earnings from the tourism sector (such as working in hotels and restaurants and driving a taxi). Indirect effects

should include non-financial livelihoods. The positive effects that occur as a result of the development of common areas and infrastructure investments in the places where tourism develops are examples of the indirect effects mentioned here. The secondary income generating effect of tourism also includes the induced effects caused by tourism workers. In other words, the expenditures of the employees in the tourism sector for their own needs are within the scope of the secondary effect. The dynamic effects of tourism on poverty include long-term changes in the economy. Some environmental effects such as the erosion of natural assets with the development of tourism are also considered as dynamic effects explained by Zhao & Xia (2020).

Blake et al. (2008) with the development of the tourism sector in the underdeveloped regions of the country, new resources will be sent to the regional economy, new business areas and employment opportunities will be created, and in parallel, economic development will be increased. The development of tourism cannot be separated from the general development policy of the economy. In other words, tourism may not always have positive effects on the country's economy and regional development. The development of tourism over time also shows that the benefit from tourism will decrease or cause negative developments. These negativities manifest themselves as regional inflation, foreign labor force, opportunity cost, disruptions in public services, foreign capital and technological transfer effects. The tourism sector requires a lot of fixed capital investment at the beginning and the payback period for these investments takes quite a long time. At the initial stage, the costs of these investments, such as airports, hotels and infrastructure, are quite high. However, there is a need for qualified human capital that will create added value in the tourism sector. In the light of these factors, the tourism sector can generate significant income for underdeveloped countries, but it is a busy and difficult sector that requires infrastructure and superstructure investments.

The relationship between tourism and addiction

Smith & Krannich (1998) in the current international economic order, as seen in many sectors in underdeveloped and developing countries, there is a dependency on developing countries in the tourism sector as investment goods, financing and knowledge-accumulation. While the dependency relationship arises at the point of meeting the goods and services brought by the western consumption patterns, on the other hand, it arises from the oligopolistic power of the international tour operators and travel agencies in the tourism sector in particular. In addition, a certain part of the tourism expenditure in the said countries returns to developed countries through multinational companies operating in the tourism sector, and a part is transferred out of the region through national tourism companies that come from the important commercial centers of that country and serve the tourism region. As in all areas of the economy, the tourism sector is entering the 21st century with new trends. The acceleration of the transition from the industrial society to the information society, the rapid changes in technology, communication and transportation bring some changes in the tourist profile and demands, tourism products, destination type and choices. Changes in the international tourism market force destinations to develop alternative tourism products and new tourism attraction centers. For this reason, in recent years, it has been witnessed that products with different qualities suitable for each market in terms of variety have started to be offered to the consumers. Assuming that the trends will continue in this way, it is foreseen that there will be some changes in the world tourism demand structure in the future.

Literature review on GDP and tourism revenues

A number of studies have been carried out in different countries on economic growth and tourism revenues. Although the results obtained differ, it has been revealed that there is a linear relationship between economic growth and tourism revenues in most of them.

Sequeira & Campos (2008) on 4 continents; In his study on European, Asian, African and Latin American countries, he concluded that there is a significant relationship between the number of tourists and tourism revenues and economic growth. In their study for African countries, Fayissa et al. (2007) determined that the incomes obtained from the tourism sector contributed positively to both the current level of gross domestic product and the economic growth of Sub-Saharan African countries. Hazari & Sgro (1995) developed a dynamic growth model as a result of their research and determined that according to this model, tourism demand leads to a long-term positive growth in open economies.

Nowak et al. (2004) found that the tourism sector has a positive contribution to economic growth in low- and middle-income countries. Lee & Chang (2008) applied panel cointegration method by using data from 1990-2002 period in their study for 55 countries. According to the results obtained, they concluded that per capita tourism expenditures, the number of tourists and the real exchange rate are effective on growth. In their study, Mercedes et al. (2013) analyzed 87 econometric studies published up to 2012, investigating the relationship between tourism and economic growth. As a result of the study, they found that there is a positive elasticity between tourism economic growth and GDP. Ivanov & Webster (2013) tried to reveal the contribution of the tourism sector to economic growth and the factors affecting economic growth in 174 countries for the years 2000-2010. As a result of the study, it was concluded that there is indeed a strong relationship between economic growth and the tourism sector.

In her study on Korea, Oh (2005) did not find a causal relationship between economic expansion and the growth of the tourism sector for this country, contrary to these studies. Balaguer & Cantarella-Jorda (2002) concluded in their study for the Spanish economy that there is a positive relationship between economic growth and tourism revenues. Skare et al. (2021) revealed that the crises that occurred during the pandemic process have long-term negative effects on the tourism sector and economic growth. Hoque et al. (2020), Foo et al. (2020) and Papanikos (2020) conducted research to test the relationship between the tourism sector and economic growth during the crisis. The findings obtained as a result of the research are that there is a linear relationship between economic growth and tourism revenues. Therefore, the decrease in tourism revenues during the crisis also led to economic contraction.

Ohlan (2017) revealed as a result of her studies that tourism creates a positive externality on economic growth. Khanh (2020) has presented a study that will reveal that the development of the tourism sector will positively affect various sectors of the economy through multiplier effects. In their study, Seghir et al. (2015) investigated the relationship between tourism expenditures and economic growth for 49 countries covering the 1988-2012 period by panel cointegration/panel causality test. As a result, mutual causality was observed between tourism expenditures and economic growth. Satrovic & Muslija (2018) discussed the relationship between FDI (foreign direct investment) and tourism for 113 countries and the period 1995-2015. In the study, in which the panel data analysis method was used, it was concluded that tourism has a positive effect on FDI. It is widely suggested in the literature (e.g. Vanegas & Croes, 2003; Theobald, 2001) that economic growth created by tourism receipts in a country stems from the relationship between exports and economic growth.

Keeping in view the positive impact of tourism on economic growth, a host of researchers across the world have investigated the dynamic relationship between tourism sector development and economic growth in the countries. Tourism is one of the largest industries in the world and plays an important role in promoting economic development (Briguglio, 1995). Tourism revenue sharing has become a popular strategy for integrated wildlife conservation and rural development in Africa (Munanura et al., 2016). Tourism industry has emerged as one of the leading service industries in the global economy in recent decades. Economic flows

generated by international tourism have become vital factors in economic growth and international economic relations in many developing countries. The economic-driven tourism growth hypothesis is supported in literature in Katircioglu (2009). Tang & Tan (2013) suggested that the tourism sector employs greater source in increasing tax revenues, export revenues, employment, and income for the global economy. As a result, this sector has been considered as a key factor in global economic development.

Several studies on tourism development and economic growth relationship on regional basis also confirmed tourism-led growth hypothesis. Some papers examine tourism contribution to economic growth of Southern African Development Community (SADC) and found that the contribution of tourism to GDP, employment, export receipts and investment is significant, though the sector's contribution to the economy varies among SADC countries. Caglayan et al. (2010) analyse panel ganger causality analysis on 11 groups of countries and covering 135 countries across the world to investigate the causal relationship between tourism revenue and economic growth for the period 1995 to 2008. Arslanturk et al. (2011) attribute these conflicting results to the fact that the existence and direction of the relationship between tourism receipts and economic growth may change through the years, a fact that standard Granger causality tests that are commonly used cannot pick up.

Research methodology

The aim of this study is to determine the relationship between international tourism revenues, inflation rates and economic growth of Morocco and North Africa between 1996-2019. It is aimed to measure whether there is a significant relationship between dependent and independent variables and how the variables affect economic growth and to make recommendations based on this. The data used in the study were obtained from the World Bank. The data set includes the years 1996-2019. All data are included in the analysis on an annual basis. In order to eliminate problems such as changing variance and normal distribution, the logarithm of the dependent variable was taken and included in the analysis. In this part of the study, data collection and method for analysis are explained. By defining the Simple Linear Regression Model, a number of assumptions of the model are listed. STATA statistics/econometrics program was used for analysis. The data used in the study were obtained from the World Bank. The data set includes the years 1996-2019. All data are included in the analysis on an annual basis. In order to eliminate problems such as changing variance and normal distribution, the logarithm of the dependent variable was taken and included in the analysis.

Regression analysis

It is a method used in analyzes to examine the numerical relationship between dependent and independent variables. In this method, it is assumed that the dependent variable is affected by the independent variable, that is, the independent variable affects the dependent variable. In the Regression analysis, if the number of dependent and independent variables is one, Simple Regression analysis, if the dependent variable is one, Multiple regression analysis if there is more than one independent variable, and if there is more than one dependent variable, Multivariate regression analysis methods are applied.

A simple regression model;

$$y = \beta_0 + \beta_1 X + \varepsilon \quad (1)$$

form is installed. In the equation;

Y; Dependent variable is X Independent variable.

β_0 ; It is a constant value and is the value of Y when X=0.



β_1 ; It is the regression coefficient. It expresses the change that will occur in the dependent variable in response to 1 unit change in the independent variable.

ϵ ; It is the random error term. It is assumed that the dependent variable contains a certain error. There is no error in the argument.

The random error ϵ is normally distributed, has a mean of zero, and has a constant spread. If the number of independent variables is more than one, a multiple linear regression model is established. If a new term, X_{i2} , is added to the simple regression model, the model is converted to a multiple linear regression model.

$$y_i = \beta_0 + \beta_1 X_i + \beta_2 X_{2i} + \epsilon_i \quad (2)$$

Here it is multivariate linear with three parameters namely β_0 , β_1 and β_2 . Multiple linear regression model if the number of independent variables is unknown:

$$y_i = \beta_0 + \beta_1 X_i + \beta_2 X_{2i} + \dots + \beta_p X_{pi} + \epsilon_i \quad (3)$$

is formulated. The dependent variable y_i in the equation; β_0 , its constant value; $X_{i..pi}$, its arguments; ϵ_i represents the error term and $\beta_{1..p}$ regression coefficients.

According to the assumption that there is no multicollinearity; There should be no relationship between independent variables.

Analyses and results

Multiple regression model we established for analysis;

$$\text{Growth (y)} = \beta_0 + \beta_1 \text{ tourism revenues (x)} + \beta_2 \text{ inflation rate} + \epsilon$$

form is installed. Since the logarithm of our dependent variable is taken, the model

$$\text{LogGrowth (y)} = \beta_0 + \beta_1 \text{ tourism revenues (x)} + \beta_2 \text{ inflation rate} + \epsilon$$

It is shown in the form.

Our Hypotheses for Analysis;

H₀: There is no relationship between growth and tourism revenues and inflation,

H₁: It was established that there is a relationship between growth and tourism revenues and inflation.

The tests performed for some basic assumptions in order to apply the model and their results are shown below;

Multicollinearity test

The Variance inflation factors for the independent variables (VIF) test was used to measure whether the independent variables were related to each other.

Table 1. VIF test results

Morocco				South Africa			
Variable		VIF	1/VIF	Variable		VIF	1/VIF
International receipts	tourism,	1.11	0.903555	International receipts	tourism,	1.73	0.577435



Inflation	1.11	0.903555	Inflation	1.73	0.577435
Mean VIF	1.11		Mean VIF	1.73	

If the VIF value is above 5, it indicates that there is a multicollinearity problem in the model. Since the value we get is below 5, it means that there is no multi-connection problem in our model.

Constant variance test

Breusch-Pagan/Cook Weisberg test was applied to find out whether the model satisfies the homoscedasticity assumption. Our hypotheses for analysis are as follows;

H₀: There is no varying variance between the error terms.

H₁: There is varying variance between the error terms.

According to the test results, our probability values are greater than 0.05 (Morocco is 0.9084 and South Africa is 0.6361), so our H₀ hypothesis is accepted. There is no problem of varying variance in the model.

Autocorrelation test

In this test, the Breusch-Godfrey LM test was used to examine whether there was autocorrelation between the error terms. Our hypotheses;

H₀: It means that there is no autocorrelation between the error terms.

H₁: It means there is autocorrelation between the error terms.

According to the autocorrelation test results, it was concluded that the probability value was greater than 0.05 (Morocco is 0.0871 and South Africa is 0.0606). In this case, there is no autocorrelation in our model. H₀ hypothesis is accepted.

Normality Test

Another assumption, the Shapiro-Wilk W test, was applied to measure the normal distribution of error terms.

Our hypotheses;

H₀: Error terms are normally distributed

H₁: Error terms are not normally distributed

Table 2. Shapiro-Wilk W test results

	Variable	Obs	W	V	z	Prob > z
	Error Term					
Morocco		24	0.96289	1.001	0.002	0.49911
South Africa		24	0.95717	1.155	0.294	0.38426

As the probability value is greater than 0.05 according to the result of the test, the H₀ hypothesis is accepted for both countries. Error terms in the model show normal distribution characteristics. According to the test results, the basic assumptions were tested in order to apply the model and it was concluded that the model was applicable. The results of the regression analysis obtained are as follows:

Table 3. Multiple regression analysis result

Morocco						
Source	SS	df	MS	Number of obs = 24		
Model	3.93509326	2	1.96754663	F (1, 20) = 253.72		
Residual	.162849749	21	.00775475	Prob > F = 0.0000		
Total	4.09794301	23	.178171435	R-squared = 0.9603		
GDP	Coef	Std.Err	T	P> t	95% Conf. Intervall	
International tourism, receipts	1.42e-10	6.51e-12	21.81	0.000	1.28e-10	1.55e-10
Inflation	-.0238177	.0169459	-1.41	0.174	-.0590585	.0114231
South Africa						
Source	SS	Df	MS	Number of obs = 24		
Model	4.02539715	2	2.01269857	F (1, 20) = 252.97		
Residual	.167081742	21	.007956273	Prob > F = 0.0000		
Total	4.19247889	23	.182281691	R-squared = 0.9601		
GDP	Coef	Std.Err	T	P> t	95% Conf. Intervall	
International tourism, receipts	1.28e-10	8.27e-12	15.47	0.000	1.11e-10	1.45e-10
Inflation	-.0309214	.0131138	-2.36	0.028	-.0581931	-.0036497

According to the analysis results; The coefficient of determination in Morocco is $R^2 = 0.9603$. The new model has the power to explain the variability in economic growth by 0.9603. Since the p value is less than α in the model ($p = 0.000 < 0.05$), it can be said that the model is significant at the 95% confidence level. Looking at the explanatory variable, it is seen that there is a significant relationship between International tourism receipts and economic growth. In this case, our H1 alternative hypothesis is accepted. When we look at the relationship between inflation and economic growth, there is no relationship. In other words, an increase in inflation does not support economic growth. If we pay attention to our analysis for South Africa, the coefficient of determination is $R^2 = 0.9601$. In other words, the model has the power to explain the variability in economic growth at the rate of 0.9601. Since the p value is less than α in the model ($p = 0.000 < 0.05$), it can be said that the model is significant at the 95% confidence level. Looking at the explanatory variable, it is seen that there is a significant relationship between International tourism, receipts and economic growth. In this case, the H1 alternative hypothesis is accepted. It is also concluded that there is a significant relationship between inflation and economic growth for South Africa. A negative coefficient value means that if inflation decreases, it will achieve economic growth, which is a meaningful result.

Discussion and conclusion

The aim of this study is to determine the relationship between the international tourism revenues and inflation rates of Morocco and South Africa between 1996-2019 and their economic growth. Multiple Linear Regression Model was used to measure whether there is a significant relationship between these variables or the effect of the relationship. Data for analysis were obtained annually from the World Bank. During the study phase, Variance inflation factors for the independent variables (VIF) test, Breusch-Pagan/Cook Weisberg test, Breusch-Godfrey LM test and Shapiro-Wilk W test were applied. As a result of the latest multiple regression analysis, it has been determined that there is a relationship between the dependent and independent variables of both countries. In other words, the increase in international tourism revenues in both countries affects economic growth positively, but the increase in inflation rates negatively affects economic growth.

In order to analyse the time-varying linkage between real tourism receipts and real GDP for South Africa for the period 1960 to 2011, we use a time-varying VECM framework to control for structural changes and regime shifts. On Morocco and Tunisia, Tang et al. (2016), Bou Zahzah et al. (2013) found in their studies that tourism revenues will positively affect economic growth. As a result of Mentari's (2021) study only on Morocco, it was concluded that there is a significant relationship between tourism revenues and economic growth. Phiri's (2016) and Akinboade et al. (2020) also concluded that there is a two-way significant relationship between tourism revenues and economic growth in his studies on South Africa. Our study result gives the same result as the studies in the literature. In other words, there is a positive relationship between economic growth and tourism revenues. Our other missing variable in the literature is that there is a negative relationship between growth and inflation. Considering that the studies in the field of tourism and economic growth related to these countries are very few in the literature, it is hoped that this study will fill this gap in the literature, albeit a little.

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