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International Tourism demand in *Ahhagar* destination in Algeria: using panel data econometric technique

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***Abstract*— The aim of this research is to study the determinants of the foreign demand on the tourism services in Ahaggar region- Algeria- for the period 1999-2012. We used a range of economic and non-economic variables, which can affect tourism demand to any tourist destination, such as per capita income in the tourists' home countries, relative price, the real effective exchange rate, in addition to dummy variables reflect the security situation in the region. The data were analyzed using panel data econometric techniques (fixed/random effects model). The study concluded that per capita income in the tourists' home countries had a positive impact on the flow of tourists to the region; whereas security chaos in Tunisia and Libya 2011 and Mali in 2012 had a negative impact; but the real effective exchange rate, the relative price and internal security risk (the kidnapping of 32 foreign tourists in 2003) had only secondary effects.**

***Keywords*— tourism demand, per capita income, relative price, exchange rate, dummy variables, panel data**

I. INTRODUCTION

The tourism is a key component of new economy, which is driving growth in most of countries in the world (Aswad, 2013), by economic and social development forms (Bouzahzah, 2012). The increasing importance of the tourism sector in terms of its contribution to the national product, the employment and the balance of payments creates the need to investigate the determinants of tourism flows within a specific country (Proenca and Soukiazi, 2005). Also can observe economic effect on society resultant from profitable market segment and pulse matching tourism, infrastructure development and creating jobs (Kurtzman, 2005)

Algeria is an almost virgin tourist destination, which are unfortunately not been sufficiently exploited in contrast to other Mediterranean countries; it is full of historical and archaeological treasures that should be discovered. These advantages allow it to become a primordial destination of coastal tourism, green tourism or cultural and historical tourism (Harouat, 2012), and despite the inclusion of tourism investments in the national development plan, it did not incite as much attention as the other sectors. Ahhagar is one of the most important tourist destination in Algeria essentially targeted by international tourists (Harouat, 2012), especially from Europe. For this purpose it is important to identify and measure the impact of the main determinants of the international tourism flows in this destination, by estimates a econometric model for tourist demand of seven principals European countries (France, Germany, Italy, Spain, Austria, Switzerland, Belgium), using panel data econometric analysis.

The remaining of the paper is organized as follows. Section 2 provides a review of the literature on the demand of tourism explaining the theoretical and empirical aspects. Section 3 explains the specification of the demand function of tourism to estimate and analyses the data. Section 4 presents the results from the panel estimations of the demand function of tourism. The final section concludes.

II. THE DETERMINANTS OF TOURISM DEMAND LITERATURES REVIEWS

Along with the phenomenal growth in demand for tourism in the world over the past two decades is a growing interest in tourism research (Song & Li, 2008). Empirically, a number considerable work has been published on the determinants of International demand tourism, with the use of multiple methods and econometric techniques since the first studies on tourism demand appeared in the year 1960, great advances have been realized , Because of the availability of data and improved econometric techniques (Bouzahzah, 2012).

A. Definition of Tourism Demand

Song and Witt (2000) define tourism demand as the amount of a set of tourist products that the consumers are willing to acquire during a specific period and under certain conditions, which controlled by the explanatory factors used in the demand equation (Proenca and Soukiazi, 2005).

B. Tourism demand Factors

It is evident that tourism demand could be affected by a wide range of factors, such as economic, attitudinal and political factors, but the majority of the econometric studies tend to examine the demand for tourism by focusing predominantly

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on economic factors. Income and prices play important roles in determining tourism demand (Song, 2010). Reported by Vanhove, (2011), Middleton in 2009 summarizes the determinants of tourism demand under 10 headings:

1. Economic factors and comparative prices
2. Demographic factors
3. Geographic factors
4. Socio-cultural attitudes to tourism
5. Mobility
6. Government/regulatory
7. Media communications
8. Information and communication technology
9. Environmental concerns and demand for more sustainable forms of tourism
10. International political developments and terrorist actions.

C. *Tourism demand modelling and forecasting methods*

Tourism demand modeling and forecasting methods can be broadly divided into two categories: quantitative and qualitative methods. In their study, Song and Turner (2006) concluded that the majority of the published studies used quantitative methods to forecast tourism demand. The quantitative forecasting literature is dominated by two sub-categories of methods: non-causal time-series models and the causal econometric approaches. The difference between them is whether the forecasting model identifies any causal relationship between the tourism demand variable and its influencing factors (Song & Li, 2008).

III. The Specification of the Demand Function of Tourism

A. *The Model*

The purpose of this paper is to study the international demand for tourism in *ahhagar* destination in Algeria, as a destination place for main tourism sending countries, especially from Europe, like France, Germany, Italy, Spain, Austria, Switzerland, Belgium, A panel data approach is used to estimate the demand function of tourism in ahhagar for a period of 14 years (1999-2012). Annual data is preferable in order to avoid seasonality problems, which are dominant in this sector.

Based on the literature review, this study takes as principle determining of international tourism demand in *ahhagar* (ITA): income (IC), relative price (RP), exchange rate (CH) and dummy variables to evaluate the effect of external shock. Having defined the variables to include in the model, we are now able to present the full specification of the demand function of tourism in *ahhagar* destination in Algeria in a log linear form:

$$Ln\,ITA_{i,t} = \alpha_i + \beta_1 Ln\,IC_{i,t} + \beta_2\ Ln\,RP_{i,t} + \beta_3 Ln\ CH_{i,t} + \beta_4\ D03 + \beta_5\ D11 + \beta_6\ D12 + \mu_{i,t}$$

$\boldsymbol{Ln\ ITA_{i,t}}$ Means the logarithm of tourism arrivals from seven principle markets (France, Germany, Italy, Spain, Austria, Switzerland, Belgium) (Source Tourism Directorate of *Tamenrasset*, Algeria);

$\boldsymbol{Ln\ IC_{i,t}}$ Is the logarithm of Income (per head) (Source perspective monde);

$\boldsymbol{Ln\ RP_{i,t}}$ Is the logarithm of report of the price consumer index in the country of destination and origin;

$\boldsymbol{Ln\ \ CH_{i,t}}$ Is the logarithm of the real effective exchange rate: Report of the price consumer index countries of destination and origin adjusted nominal exchange rate;

$\boldsymbol{D03}$ Dummy variable to capture the effect of the Internal risk (The kidnapping of 32 European tourists 2003);

$\boldsymbol{D11}$ Dummy variable to capture the effect of the External risk (Revolutions in Tunisian and Libyan in 2011);

$\boldsymbol{D12}$ Dummy variable to capture the effect of the External risk (War in Mali 2012);

$\mu_{i,t}$ is the stochastic error.

The data are organized in a panel form with $i = 7$ and $t = 14$, years giving a total of 98 strongly unbalanced observations.

IV. Estimation Results

The Equation is estimated by using the panel data estimation methods technique (fixed / random effects), using EVIEWS, the results are reported in Table 02 refers to fixed effect model, Table 03 refers to random effect model .

TABLE01 : ESTIMATION OF THE DEMAND FUNCTION OF TOURISM IN AHHAGAR _FIXED EFFECTS

$\boldsymbol{LnITA_D}$	**COEFFICIENT**	**PROB.**
CONST	-99.07777	0.0141
$\boldsymbol{LnICD}$	9.437726	0.0038
$\boldsymbol{LnRPD}$	2.004672	0.5410
$\boldsymbol{LnCH}$	-1.386164	0.5128
$\boldsymbol{D03}$	0.363582	0.2660
$\boldsymbol{D11}$	-0.394799	0.3201

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D12	-1.776581	0.0001
R^2	0.748813	
NUMBER OF OBSERVATIONS	91	
NUMBER OF GROUPS	07	
OB PER GROUPS	14	
DURBIN-WATSON STAT	**1.728161**	

TABLE 02 : ESTIMATION OF THE DEMAND FUNCTION OF TOURISM IN AHHAGAR _ RANDOM EFFECTS

$LnITA_D$	COEFFICIENT	PROB.
CONST	-11.90697	0.5732
LnICD	2.331469	0.1501
LnRPD	0.971675	0.7653
LnCH	1.631891	0.3599
D03	0.424190	0.1936
D11	-0.444762	0.2622
D12	-1.736063	0.0001
R^2	0.235194	
NUMBER OF OBSERVATIONS	91	
NUMBER OF GROUPS	07	
OB PER GROUPS	14	
DURBIN-WATSON STAT	1.479671	

To decide between fixed or random effects Hausman specification test has been applied where the null hypothesis is that the preferred model is random effects vs. the alternative the fixed effects. The result of Hausman test show that is Prob>Chi2 = 0.0420 is more than 0.05; we must accept the hypothesis, so the appropriate model is fixed effect.

V. CONCLUSIONS

The result of FEM suggests that Income (IC) is statistically significant, the positive sign of coefficient implies that an increase in Income (per head) in sending countries (France, Germany, Italy, Spain, Austria, Switzerland, Belgium), will result to an increase in tourist arrivals to ahhagar, The temporary increase in the income of these tourists can be oriented to the spending goods and \ or other services like tourism to ahhagar destination.

Also, the relative price 〖(RP)〗_ statistically not significant, the positive sign of coefficient implies that an increase relative price will result to an increase in tourist arrivals (France, Germany, Italy, Spain, Austria, Switzerland, Belgium) to ahhagar, Contrary to what is expected, this result proves that the tourists are not sensitive to prices of ahhagar destination.

In accordance with economic intuition the real effective exchange rate (CH) has a negative impact and statistically not significant, on tourist arrivals that an increase the real effective exchange rate will result to a low in tourist arrivals to ahhagar destination. This result proves that the tourists (France, Germany, Italy, Spain, Austria, Switzerland, and Belgium) are sensitive to real effective exchange rate of ahhagar destination.

The dummy variable D03 of Internal risk (The kidnapping of 32 European tourists in 2003) has a negative impact but statistically not significant. This result proves that the tourists (France, Germany, Italy, Spain, Austria, Switzerland, and Belgium) are not sensitive to internal risk in 2003.

The dummy variables D11 of the External risk revolutions events in Tunisian and Libyan in 2011, has a negative impact and statistically not significant. This result proves that the tourists (France, Germany, Italy, Spain, Austria, Switzerland, and Belgium) are sensitive to the External risk of Revolutions in Tunisian and Libyan in 2011.

The dummy variables D12 of the External risk of War in Mali 2012, has a negative impact and statistically significant. This result proves that the tourists (France, Germany, Italy, Spain, Austria, Switzerland, and Belgium) are sensitive to the External risk of Revolutions in Tunisian and Libyan in 2011 and War in Mali 2012.

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