The Effect of the Changed Behaviour of the Foreign Tourist on the Unorganised Foreign Tourism in the Context of the Absence of E-payment in Algeria

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Abstract

Although Algeria has achieved a noticeable development in the field of information and communication technology in several sectors; the absence of an intersectorial approach between the sectors of tourism and banking is negatively affecting the tourism sector, on the one hand, and the regional (Algeria) dynamism, on the other hand. In this context, this research paper measures the effect of this absence on the national economy and its future consequences if things remain what they are. It takes into consideration the continuous and increasing orientation of the national tourism companies to seek for the alternative consisting in foreign e-booking systems to compensate for this lack at the national level, for minimized the e-booking cancellation by the foreign tourists.

Keywords: E-tourism; Unorganised foreign tourism; E-payment; intersectorial approach between the sectors of tourism and banking, Algeria

1- Introduction

Information and communication technology is one of the main tools participating to the integration of the world markets and enhancing development chances. The tourism sector is one of the most important service sectors. It is the fifth greatest exporting sector. The international tourism has achieved in 2012 a rate of 4% of development to reach 1075 $, including 42% via E-booking (World Tourism Barometer, August 2013). Thus, tourism is considered as the first service industry which uses information and communication technology. It occupies the first rank in matters of E-commerce.

The use of such a technology has revolutionized the behaviour of both producers and consumers. This new technique makes it possible to have direct contact with tourists, mainly foreigners.

Although Algeria, as other under-developed countries, has become aware of the great importance of information and communication technology as an efficient means of promotion of their tourism offers, expansion of their customer base, encouragement of the spread of electronic commercial practices in the national economy, and improvement of organisation of their tourism industry; and despite the great potential tourism market of Algeria as a tourist destination; the absence of complementarily between different sectors, and mainly the absence of an intersectorial approach between the sectors of tourism and banking in matters of E-payment has affected the tourism market of Algeria as a tourist destination, on the one hand; and affected the national economy as a whole. This occurs in a context of an intense competition between countries (mainly regional neighbouring ones) in matters of attraction of tourists and gaining their loyalty; mainly foreign ones.

1- 1- Research Problem

The challenge facing the tourist destination of Algeria does not consist only in the revolution of the information and communication technology, and to what extent Algeria will use it to promote its tourist destination; but rather consists of the absence of the political will to achieve complementarily between different sectors, and mainly in the absence of a complementarily between the sectors of tourism and banking. This greatly affects the performance of the tourist destination of Algeria. So, the problem tackled in this research is that of emphasizing the effect of absence of the said approach on the national economy.

In view of the previous elements, we will try to answer, in this paper, the following question: "What is the effect of the absence of the intersectorial approach between the sectors of tourism and banking on the Algerian national economy, in the context of the unorganised foreign tourism in Algeria?"

1- 2- Aims of the Research:

This research mainly aims at the following:

- Recognizing the major financial losses undergone by the national economy as regards unorganised foreign tourism, in the absence of an intersectorial approach between the sectors of tourism and banking;
- Shedding light on the future development of the said losses in the event of continuing of the status quo;
- Emphasizing the importance of an intersectorial approach between the sectors of tourism and banking in order to underline the necessity of quicken the application of the E-payment system in Algeria.

1- 3- Importance of the Research

This research takes its importance in that it sheds light on the major probable losses (in hard currency) undergone by the national economy because of current using of foreign E-payment systems by the national tourism companies; as well as in that it tries to clarify the future effects if E-payment systems continue to be absent because of using foreign E-payment systems by the national tourism companies as an alternative to this absence.

1- 4- Hypotheses of the Research

Predicting an answer to this question, in advance, we make the following hypotheses:

- The absence of an intersectorial approach between the sectors of tourism an banking engenders great financial losses in matters of hard currency undergone by the national economy as regards unorganised foreign tourism in Algeria;
- If the status quo continues in the future concerning the absence of an approach between the sectors of tourism and banking; the financial losses undergone by the national economy will be greater as regards unorganised foreign tourism in Algeria.

1- 5- Theoretical Framework of the Research

The concept of E-tourism is new in the field of tourism. It greatly interferes with E-commerce. E-tourism refers to the use of electronic works in tourism and travel industry, through the integration of information and communication technology in tourism works, mainly on the Internet (Teresa Garín Muñoz and Teodosio Pérez Amaral, July 2010; Gulcin Buyukozkan and Buse Ergun, 2011). We can call any tourism activity "electronic" or "E-tourism", if there is a use of information and communication technology, mainly the Internet, in therein tourism business, such as tourism services, E-booking and E-payment.

The importance of E-tourism lies in the volume of profits it supplies both tourism service providers and consumers with, through facilitating the supply with information the industry of tourism depends on. In fact, it is now possible for the tourist using the Internet to compare different tourist destinations in terms of offer quality and prices, with no need to travel to the place of service providing (Shahrzad Eftekharmanavi and all, April 2013; Javier Blanco, 2011; Konosoang Mpiti, 21 January 2014); mainly thanks to the second generation of Internet Web 2.0 (Stephen Litvin and all, June 2008), which plays a major role in electronically providing tourist information necessary to make the decision of E-booking (Susan Scott and Wanda Orlikowski, 2012). It also permits the tourist service providers to diminish costs, and helps consequently the tourist products to acquire competitiveness. The costs of tourism marketing are diminished through the facilitation and speeding up of communication between tourist service producers and the tourist intermediaries. The costs of distribution are also decreased thanks to the facilitation of striking bargains between a large number of tourists and expanded geographical coverage (Davoud Bagheri and Hamed Golrokhsari, July 2012).

This mutation in the model of tourism has accentuated the competition between tourism companies on the Internet. Thus, the competition is no longer limited to the prices and the quality of services, leans more to the method of reaching tourist services to the consumers using the Internet, in the existence of a great number of tourism companies in the E-tourism market (Emmanouil Stiakakis and Christos Georgiadis, 2011; Marcello Mariani and all, 2014).

However, E-tourism in Algeria suffers from the lack of an intersectorial approach between the sectors of tourism and banking. This caused the tourism companies to lose lots of their customers. In fact, the E-booking is not enough alone to keep customers loyal to a given tourism destination in the context of hard foreign competition. This approach, E-payment one, is one of the necessary loops of the E-tourism work. It may be achieved through linking the E-payment systems to those of booking and distribution through which it is possible to use credit cards and E-checks for E-payment between tourism operators and tourists via the Internet, by the means of e-commerce application service providers called "E-payment gateways" which makes electronic compensation and transfer of the sum of money from the account of the clients to that of the tourism company (Shi Jen Lin and Ding Chyu Liu, 2009), with no need for both parties to the financial establishments to achieve the tourism operation.

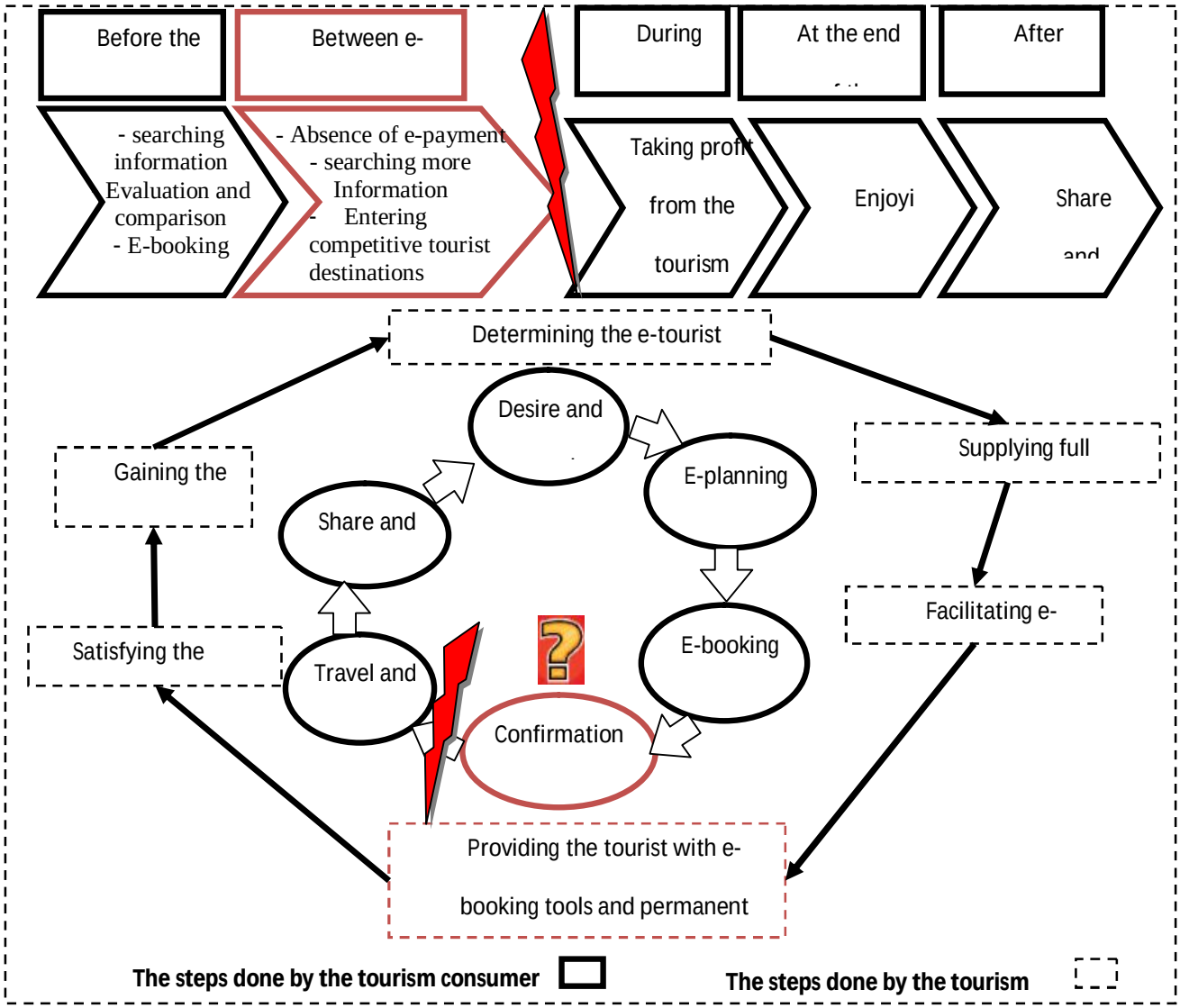
The intersectorial approach between the sectors of tourism and banking is of a great importance in that it helps tourism operators to expand tourism markets in general, through participating to attract new potential tourists (Issa Seif Salim and all, June 2013; Rob Law and Andrew Cheung, 2006). It makes it possible for tourism operators to influence the future behaviour of tourists which is continuously fluctuant, helps them to increase their tourism incomes through the activation of sales (Roland Schegg and all, 2002), decrease of constant costs (William Dougan and James Bronson, 2003) and providing comfort for tourists using the Internet, in terms of time and effort saving as well as in terms of low costs (Tanai Khiaonarong, 2000).

However, the lack of the intersectorial approach between the sectors of tourism and banking in its E-payment side in Algeria is considered as one of the major factors which push the E-tourism consumer to postpone the operation of E-procurement via the Internet. Such a postponement has got a direct negative effect on the national tourism companies, because they have no guarantee that the consumer who has booked their tourism service will not change its procurement attitude. The intention of purchase (procurement) means a possibility to purchase the tourism service that is executed through an E-booking. It strongly depends on the attitude of the tourist using the Internet towards a given tourism service. The intention of purchase changes according to the future behaviour of tourists using the Internet towards the concerned destination (Angella Kim and Eunju Ko, 2012). So, the E-booking in the absence of an intersectorial approach between the sectors of tourism and banking is not enough to control the future behaviour of the tourist using the Internet. This because the operation of changing destination by the tourist using the Internet is a dynamic one, through which interactive modifications may be made in order to get adapted with the close environment of the tourist concerning different tourist destinations. Thus, the majority of tourists using the Internet often change their original trip plans during the stage of planning to elevate their profit in way that achieve their desire and fit their potentialities.

The characteristics of the tourist who uses the Internet affect, predominantly, the operation of changing the first, original destination. Each tourist has got the possibilities of dealing with new, unexpected situations (Yeongbae Choe, 21 January 2014) thanks to the relative freedom in the behaviour of tourists in the absence of E-payment (Kevin Moore and all, 2012). This is one the major reasons that push the tourist to change their destination (Suzanne Amaro and Paulo Duarte, 2013).

Unorganised foreign tourism is one of the most common in Algeria. It consists in the operation of tourism directly done between different tourism operators in Algeria and the foreign tourist. This kind of tourism is noticeably decreasing due to the current inappropriate political and security situation in Algeria; and to the absence of an integrated system of information and communication technology, mainly the absence of an intersectorial approach between tourism and banking in matters of e-payment. This situation has pushed the different national tourism operators to opt for this kind of tourism as a confirmed tourism market supplying the tourists using the Internet the tool of e-payment. Using this tool, the tourism operators diminish the probability of cancelling by the tourists of their e-booking, unless in emergency cases, through entering into contracts with foreign tourism companies, or opening a branch of the tourism company in Algeria. This operation is shown in the following figure:

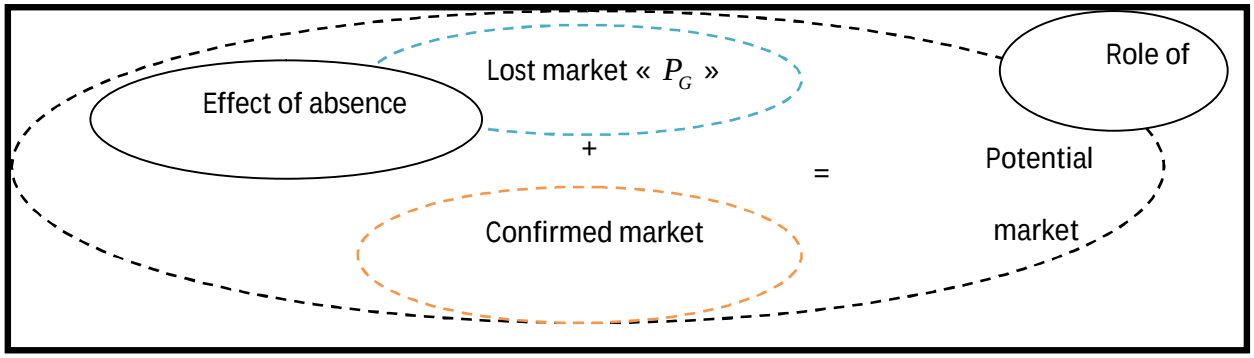
Figure (01): The Current State of Unorganised E-Tourism in Algeria



Source: Set by the researcher

This kind of tourism has a great influence on the tourism destination of Algeria due to the loss of a part of hard currency. This loss is caused by the absence of e-payment, as shown in the figure above from which reveals the effect of absence of e-payment as follows:

Figure (02): Represents the Components of the Potential Tourism Market in Algeria between the role of the Internet and the Effects of Absence of E-Payment



Source: Set by the researcher

This means that valorising the tourism potential market « M_P » needs to maximise the confirmed tourism market « M_A », through the extreme possible minimisation of the lost tourism market « P_G ». To do so, the average cancellation of e-booking « R » by the foreign tourists must be reduced through providing e-payment on the Internet.

So, the potential tourism market « M_P » is an equation in the confirmed tourism market « M_A », on the one hand;

$$M_P = f(M_A) \quad \ldots\ldots(1)$$

In order to valorise the potential tourism market of the tourism destination of Algeria, we have to maximise the confirmed tourism market of this destination.

On the other hand, the confirmed tourism market « M_A » is an equation in the lost tourism market « P_G », as follows:

$$M_A = f(P_G) \quad \ldots\ldots(2)$$

In order to valorise the potential tourism market of the tourism destination of Algeria, we have to maximise the confirmed tourism market of this destination through the minimisation of the lost tourism market of this destination.

On a third side, the lost tourism market « P_G » is an equation in the average of e-booking cancellation by the foreign tourists « R », as follows:

$$P_G = f(R) \quad \ldots\ldots(3)$$

This means that in order to valorise the potential tourism market of the tourism destination of Algeria, we have to maximise the confirmed tourism market of this destination through the minimisation of the lost tourism market of this destination by diminishing the average of e-booking cancellation by the foreign tourists.

This means, at last, that the potential tourism market « M_P » is an equation in the average of e-booking cancellation « R » by the foreign tourists, as follows:

$$M_P = f(R) \quad \ldots\ldots(4)$$

So, in order to maximise the tourism market of the tourism destination of Algeria, we have to maximise the potential tourism market of this destination, using the information and communication technology, mainly the Internet, in the ideal tourism promotion of the said tourism destination, on the one hand. We have, on the other hand, to valorise this potential tourism market through providing the possibility of e-payment on the Internet. Therefore, we can reduce the averages of e-booking cancellation by the foreign tourists, and diminish the volume of the lost tourism market to increase the volume of the confirmed tourism market of Algeria destination.

2- The Methodology of the Research

2- 1- The population of the Research

The population studied in this research is that of the tourism operators in Algeria: agents of tourism and travel and organisers of tourism trips. This study included 49 tourism operators; among them are two (02) organisers of tourism trips and 47 agencies of tourism and travel. The total number of this kind of agencies is of 400 distributed on the national territory. The population taken for study represents 12.26% of the tourism market in Algeria. We have specially focused on the tourism agencies that have the greater deal with foreign tourists and distributed over the national territory. The majority are from the provinces of Tamanrasset, Illizi, Algiers, El Oued, Oran, Tlemcen, Ain Temouchent, Annaba, and Batna.

2-2- Methods of Collecting Data

We used in this study the database obtained from the Ministry of Tourism and Craft Industries. We also made interviews with some officials of the sector in the said ministry, on the one hand, and a field study through distributing questionnaires on 49 Algerian tourism operators (agents of tourism and travel, and organisers).

2-3- Tools of Statistical Analysis

We have used the descriptive analytical method to determine the variables of the study. We have also used the mathematical method in the field study in order to make a mathematical analysis of the different variables of the study. Among the tools of the study, we have set a mathematical model to measure the impact of absence of an approach between the sectors of tourism and banking on the national economy. Afterwards, we have used the « R » programming language using the model « ARMA », to predict the future impact of this absence on the national economy, and we have also used the « MATLAB » program in the operation of modelling, as follows:

2-3-1- Determining the Main Variables of the Mathematical Model

2-3-1-1- Incomes of the Organised Foreign Tourism « T_{Ft} »

This consists of the tourism incomes resulting annually from the E-procurement or E-booking done by the foreign tourists via the Internet in the context of organised foreign tourism between the national and foreign tourism operators. So, we can calculate these incomes using the following equation:

$$T_{Ft} = MG_t * i_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

Given that: **« T_{Ft} »:** *is the sum of money gained from E-booking; that* « M_G »: *is the total sum of money (income) of tourism;* « i »: *represents the Rate Organised Foreign Tourism; and that* « t »: *is the time (years).*

2-3-1-2- Calculation of the Incomes of Unorganised Tourism « T_{IFt} **»**

This consists of the tourism incomes resulting from the difference between the total tourism incomes and the tourism incomes of the foreign organised tourism. So, we can calculate these incomes using the equation (6) as follows:

$$T_{IFt} = MG_t - T_{Ft}$$

$$T_{IFt} = MG_t(1 - i_t) \ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

where: **« T_{Ft} »:** *Organised tourism;* **«** T_{IFt} **»***: Unorganised tourism*

2-3-1-3- Calculation of the Loss in the Context of Unorganised Tourism « P_{Nn} »

In order to calculate the loss undergone by the national economy in the context of unorganised foreign tourism due to the absence of e-payment via the Internet, we do what follows:

2-3-1-3-1- Determination of the Volume of the Potential Foreign Tourism Market « M_{Pt} »

The potential foreign tourism market is the total number of tourists who have made an e-booking, as shown in the figure 02 above. So, we can calculate the volume of the potential foreign tourism market through the following equation (7):

$$M_{Pt} = M_{At} + P_{Gt} \ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

where « M_{Pt} »: *potential tourism market;* « M_{At} »: *confirmed tourism market;* **« P_G »:** *total amount of loss*

2-3-1-3-2- Determination of the Amount of E-booking done in the Context of Unorganised Foreign Tourism « ET_{IFt} »

It is the amount earned in context of unorganised e-tourism.

It may be calculated using the equation (8) as follows:

$$\mathrm{E}T_{IFt} = \mathrm{T}_{\mathrm{IFt}} * \mathrm{I}_{\mathrm{t}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots(8)$$

Where « I »**:** *average of e-booking.*

Knowing that the confirmed tourism market, i.e. the foreign tourists who have really visited Algeria, and only those who have made an e-booking, is the same as the confirmed tourism market in the context of unorganised tourism market, as follows:

$$\mathrm{E}T_{IFt} = \mathrm{M}_{\mathrm{At}}$$

So, the potential foreign tourism market equals the sum of confirmed tourism market plus the lost tourism market, as show in the figure (2) above. Accordingly, the volume of the foreign tourism market may be calculated using the following equation:

$$\mathrm{M}_{\mathrm{Pt}} = (\mathrm{T}_{\mathrm{IFt}} * I) + P_{Gt}$$

Thus, the potential foreign tourism market is calculated using the equation (9) as follows:

$$M_{Pt} = \frac{M_A}{1 - R_t} \ldots\ldots\ldots \quad \ldots\ldots(9)$$

where: « R_t »: *the average of e-booking cancellation, situated between (1,0);*

Consequently, we obtain the total amount of loss as follows:

$$P_{Gt} = \mathrm{M}_{\mathrm{Pt}} - (\mathrm{T}_{\mathrm{IFt}} * I_t)$$

$$P_{Gt} = \frac{(\mathrm{T}_{\mathrm{IFt}} * I_t)}{1 - R_t} - (\mathrm{T}_{\mathrm{IFt}} * I_t)$$

$$P_{Gt} = (\mathrm{T}_{\mathrm{IFt}} * I_t)\left(\frac{R_t}{1 - R_t}\right)$$

$$P_{Gt} = \mathrm{M}_{\mathrm{Gt}}\left[(1 - i_t) * I_t * \left(\frac{R_t}{1 - R_t}\right)\right] \ldots\ldots\ldots\ldots\ldots(10)$$

2-3-1-4- Calculation of the Net Amount of the Total Losses « P_{Nn} »

It is the total amount of loss minus the lost commissions taken if the foreign tourist cancels the e-booking. In order to calculate this amount, we do what follows:

$$\mathrm{P}_{\mathrm{N}1} = (\mathrm{P}_{\mathrm{G}} * \mathrm{T}_1) * \mathrm{L}_1 \Rightarrow \mathrm{P}_{\mathrm{N}1} = \mathrm{P}_{\mathrm{G}} * \mathrm{T}_1 * \mathrm{L}$$

$$\mathrm{P}_{\mathrm{N}2} = \left[(\mathrm{P}_{\mathrm{G}}(1 - \mathrm{T}_1)) * \mathrm{T}_2\right] * \mathrm{L}_2 \Rightarrow \mathrm{P}_{\mathrm{N}2} = \mathrm{P}_{\mathrm{G}}(1 - \mathrm{T}_1) * \mathrm{T}_2 * \mathrm{L}_2$$

$$\mathrm{P}_{\mathrm{N}3} = \left[(\mathrm{P}_{\mathrm{G}}(1 - \mathrm{T}_1)(1 - \mathrm{T}_2)) * \mathrm{T}_3\right] * \mathrm{L}_3 \Rightarrow \mathrm{P}_{\mathrm{N}3} = \mathrm{P}_{\mathrm{G}}(1 - \mathrm{T}_1)(1 - \mathrm{T}_2) * \mathrm{T}_3 * \mathrm{L}_3$$

$$\mathrm{P}_{\mathrm{N}4} = \left[(\mathrm{P}_{\mathrm{G}}(1 - \mathrm{T}_1)(1 - \mathrm{T}_2)(1 - \mathrm{T}_3)) * \mathrm{T}_4\right] * \mathrm{L}_4 \Rightarrow \mathrm{P}_{\mathrm{N}4} = \mathrm{P}_{\mathrm{G}}(1 - \mathrm{T}_1)(1 - \mathrm{T}_2)(1 - \mathrm{T}_3) * \mathrm{T}_4 * \mathrm{L}_4$$

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$$\mathrm{P}_{\mathrm{Nk}} = \left[(\mathrm{P}_{\mathrm{G}}(1 - \mathrm{T}_1)(1 - \mathrm{T}_2)(1 - \mathrm{T}_3) \ldots\ldots\ldots (1 - \mathrm{T}_{k-1})) * \mathrm{T}_k\right] * \mathrm{L}_k \Rightarrow \mathrm{P}_{\mathrm{Nk}} = \mathrm{P}_{\mathrm{G}} \prod_{s=1}^{k-1}(1 - \mathrm{T}_s) * \mathrm{T}_s * \mathrm{L}_k$$

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$$\mathrm{P}_{\mathrm{Nn}} = \left[(\mathrm{P}_{\mathrm{G}}(1 - \mathrm{T}_1)(1 - \mathrm{T}_2)(1 - \mathrm{T}_3) \ldots\ldots\ldots (1 - \mathrm{T}_{n-1})) * \mathrm{T}_n\right] * \mathrm{L}_n \Rightarrow \mathrm{P}_{\mathrm{Nn}} = \mathrm{P}_{\mathrm{G}}\left[(\mathrm{T}_1 * \mathrm{L}_1) + \left(\sum_{k=2}^{n} \prod_{s=1}^{k-1}(1 - \mathrm{T}_s)\right) * \mathrm{T}_k * \mathrm{L}_k\right]$$

So, we obtain the following:

$$P_{NTIFt} = \left[(M_{Gt}(1 - i_t) * I_t)\left(\frac{R_t}{1 - R_t}\right)\right]\left[(T_1 * L_1) + (\sum_{k=2}^{n} \prod_{s=1}^{k-1} (1 - T_s)) * T_k * L_k \right] \quad \text{.....} \quad \text{....(11)}$$

where « T »: *time is which the e-booking is cancelled (results of the field study, see annex 01) /* « L »: *the commission taken by the tourism company for each cancelled booking (put according to the conditions of e-booking in France).*

According to the mathematical model explained in the equation N°11, we can calculate the financial losses undergone by the national economy because of the resort by the national tourism companies to the foreign systems of e-booking as an alternative to the absence of e-payment at the national level.

2-3-2- The « R » Programming Language

We have used the « R » programming language (see annex 05) to predict the future development of these probable financial losses. We have used this programming language because of the existence of a mutation in the studied series (series of tourism incomes). In fact this programming language is especially set for such cases.

2-3-3- Mathematical programming Language « MATLAB »

We have used this language in the operation of calculation to translate the mathematical link N° 11 into a program that is applied in MATLAB. The results are displayed in the figures (3) and (4) respectively.

3- Analysis and Discussion of Results

3-1- Measuring the Present Impact of the Absence of E-payment on the National Economy in the Context of Unorganised Foreign Tourism:

In the following table, we have determined the different elements that permit us to measure the present financial losses undergone by the national economy because of the lack of e-payment in the context of the unorganised foreign tourism:

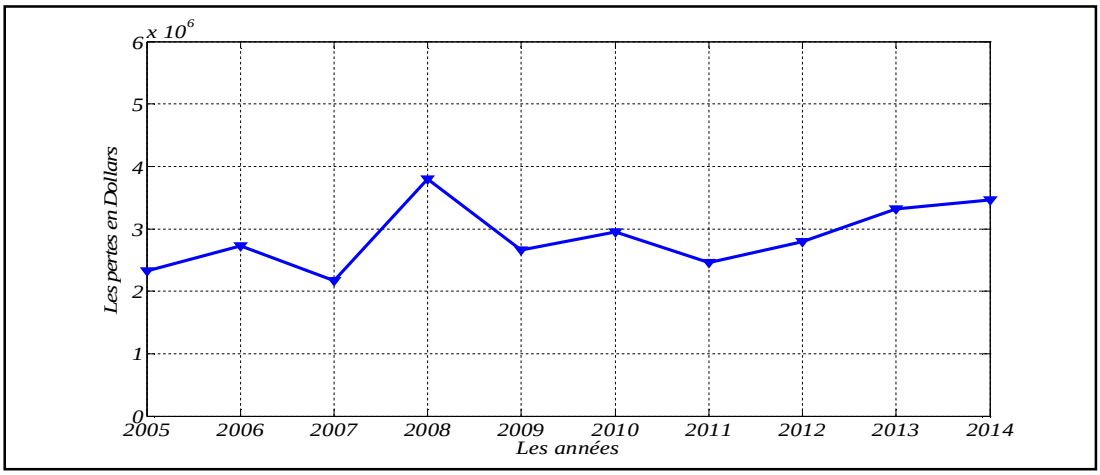
Table (01): The Losses Undergone by the Algerian National Economy from 2005 to 2014 in Algeria

years	M_{At} (million $)	R_t	I_t	$1-R_t$	$M_{Pt} = M_{At} / 1-R_t$	i_t	P_{NTIFt} (million $)
2005	184.5	29.31%	0,2931	0,7069	456 843	73%	2.3263
2006	215.3	29.31%	0,2931	0,7069	454 203	73%	2.7291
2007	218.9	27.66%	0,2766	0,7234	450 221	77.5%	2.1670
2008	300	26.61%	0,2661	0,7339	489 497	68%	3.8003
2009	330	25.95%	0,2595	0,7405	439 824	78%	2.6601
2010	400	26.45%	0,2645	0,7355	512 300	79%	2.9482
2011	430	23.29%	0,2329	0,7671	821 160	80%	2.4624
2012	470	28,00%	0,28	0,72	975 314	83%	2.7893
2013	487.86	31.60%	0,316	0,684	983 041	83%	3.1304
2014	531.08	32.89%	0,3289	0,6711	1 043 064	85%	3.4541

Source: Set by the researcher using the database obtained from the Ministry of Tourism and Craft Industry and the database obtained from the results of the questionnaires.

From the table above, we can notice the volume of financial losses (in hard currency) undergone by the national economy because of the resort by the national tourism companies to the foreign systems of e-payment. This is fulfilled using four systems of electronic intermediaries. Each one of them gains a commission as said above. The financial losses are shown in the following figure:

Figure (03): Estimation of Financial Losses from 2005 to 2014 in Algeria



Source: Set by the researcher using the programming « MATLAB »

The figure above shows the volume of the financial losses undergone by the national economy because of resort by the national tourism companies to the foreign systems of e-booking as an alternative to the absence of e-payment at the national level. These losses have proved a great increase from year to year. These financial losses have shifted (according to our appreciation) from 7.183 million dollars, representing a rate of 03.90% of the total tourism incomes of 2005, to almost 24.708 million dollars, representing a rate of 04.65% of the same incomes lost by the national economy, in 2014. This means that the losses of the national economy in terms of hard currency are more than 140 million dollars between 2005 and 2014. This exceeds the deficit in the national tourism balance for the same period. i.e. if Algeria was using the e-payment in the said period, it would have been possible to achieve a tourism balance surplus (the database obtained from the Ministry of Tourism and Craft Industry, 17 nov 2014). This shows the importance of an intersectorial approach between the sectors of tourism and banking to develop the tourism sector.

This shows the importance of an intersectorial approach between tourism and banking in the development of the tourism sector. In fact, this approach plays a major role in the improvement and enhancement of the power and potentiality of Algeria tourism destination through her different tourism operators, mainly via the agencies of tourism and travel. It permits to gain the prior loyalty of the foreign tourist, and diminishes, thus, the probability of cancelling the e-booking by this tourist who, otherwise, feels himself not granted full freedom of his permanently changing tourism behaviour.

3-2- Measuring the Future Impact of the Absence of E-payment on the National Economy Using the « *ARMA* » Model (Auto Regressive Moving Average model):

Hypothesis of the Model 01: Suppose that things will stay as they are concerning the absence of e-payment (intersectorial approach) in Algeria.

To calculate the future impact which may be undergone by the national economy because of the absence of e-payment in the context of unorganised foreign tourism; we have used the time series entering in the modelling of many natural, social and economic phenomena that take different values over time. These models are used to predict the values and behaviour of such phenomena in future (see annex N° 05).

In this study, we have used the methods of processing using in the time series the « R » programming language through the « *ARMA* » model. In fact, there are random variations (white noise) within the series of tourism incomes. The « R » language is a mathematical program specifically used for these cases (see annex N° 05).

So that we calculate the amount (sum) of loss **«** P_{NTIFt} **»**, from 2015 to 2022, we have to do what follows:

3-2-1- Estimating Tourism Incomes and Organised Foreign Tourism Averages from 2015 to 2022:

In order to estimate these incomes, we use the « R » programming language and make the following steps

3-2-1-1- Removing the General Trend of the Two Series

We remove the "general trend" « $T(t)$ » and the "seasonal variations" « $S(t)$ » of the two series using the « R » programming language, as shown in the annex (01), in which we notice that the curve representing the time series of tourism incomes shows a mutation in the period 1994-1997. This mutation is called "white noise" of the series. That is why we have used this program, especially conceived for such cases. We also notice the absence of the general trend and the seasonal variations of the series of tourism incomes. Nonetheless, in the curve representing the series of averages of Organised Foreign Tourism, we notice the existence of a general trend (linear trend) without seasonal variations. Using the « R » language, we remove this general trend of the series, as shown in the annex N° 02.

3-2-1-2- Calculating the Correlations and the Partial Correlations of the Two Series

After removing the general trend and the seasonal variations of the two series, we calculate the correlations and the partial correlations using the R programming language. The results are shown in the following table:

Table (02): Correlations and Partial Correlations of two series of Tourism Incomes « M_{Gt} », and Organised Foreign Tourism Rate « i »

Years		2005	2006	2007	2008	2009	2010	2011	2012	2013
Tourism incomes « M_{Gt} »	Correlations	0,39	-0,06	0,3	-0,2	0,15	-0,18	0,08	-0.15	-0.01
	Partial correlations	0,12	-0,10	0,09	-0,21	-0,04	0,05	-0,05	0.04	-0.10
Rate of Organised Foreign Tourism « i »	Correlations	0,23	-0,23	-0,01	0,14	-0,05	0,02	-0,04	-0,02	-0,00
	Partial correlations	-0,07	-0,20	-0,31	-0,01	0,02	-0,06	-0,03	-0,02	-0,09

Source: Set by the researcher using the programming language « R »

3-2-1-3- Determining the Order of the Corresponding Models of each Series

So that we to determine the order of the model « *ARMA* » corresponding to each series, we use the criterion «AIC» shown in the relation (12) and representing the function of the variables « p,q ». We determine the minimal boundary value of this criterion after making all possible combinations, as follows:

$$AIC(p,q) = \log \hat{\sigma}^2{}_{\varepsilon}(p,q) + \left(2(p+q)/T\right) \ldots\ldots\ldots\ldots (12)$$

Given that: T **:** the number of values of the times series;

p **:** the Order of the model « AR »;

q : the order of the model « MA »;

$\hat{\sigma}^2{}_{\varepsilon}$ **:** the experimental contrast of the white noise (random variations).

So, we get the results given in the following table:

Table (03): Estimated Values of the Series of Tourism Incomes « M_{Gt} » and Organised Foreign Tourism Rate « i »

	Tourism incomes « M_{Gt} »				Rate of Organised Foreign Tourism « i »						
	Coefficients of the model «AR»		Coefficients of the model «MA»		Coefficients of the model «AR»			Coefficients of the model «MA»			
Estimated coefficients	φ_1	φ_2	θ_1	θ_2	φ_1	φ_2	φ_3	θ_1	θ_2	θ_3	θ_4
	0,2861	0,3999	- 0,0741	0,862	-0,8828	-0,8826	0,9996	-1,1322	-0,7761	-1,0121	-0,7472
Error probability	0,311	0,2832	0,1745	0,1645	0,7182	0,9935	0,7169	0,2006	0,3221	0,2370	0,1806
Contrast « $\hat{\sigma}^2{}_{\varepsilon}$ »	465,7				1,919						
Criterion «AIC»	211,03				69,77						

Source: Set by the researcher using the programming language « R ».

From the table above, we find that the order the model « *ARMA* », corresponding to the series of tourism incomes « M_{Gt} » is (2,0,2),à and that the order of the series of Rate of Organised Foreign Tourism « i » is (3,0,4).

3-2-1-4- Estimating the Tourism Incomes and the Rate of Organised Foreign Tourism of the Period of Prediction

Through the substitution of the estimated coefficients, as shown in the table above, equation (22) in the annex (05), we obtain the equation (13) and (14) of the tourism incomes and Rate of Organised Foreign Tourism respectively:

$$X(t)-\varphi_1 X(t-1)-\varphi_2 X(t-2)=\varepsilon(t)+\theta_1\varepsilon(t-1)+\theta_2\varepsilon(t-2).....(13)$$

$$X(t)-\varphi_1 X(t-1)-\varphi_2 X(t-2)-\varphi_3 X(t-3)=\varepsilon(t)+\theta_1\varepsilon(t-1)+\theta_2\varepsilon(t-2)+\theta_3\varepsilon(t-3)+\theta_4\varepsilon(t-4).....(14)$$

So, we obtain the results shown in the following table:

Table (04): Estimated Amounts of the Tourism Incomes and Rate of Organised Foreign Tourism

Years		2015	2016	2017	2018	2019	2020	2021	2022
Estimated Tourism incomes « M_{Gt} » (million $)	**Amount**	546,36	585,57	598,92	634,81	646,74	679,88	690,79	721,63
	Margin of Error	4,9	4,92	5,05	5,06	5,15	5,15	5,21	5,21
Estimated Rate of Organised Foreign Tourism « i »	**Rates**	83,29 %	88,98 %	84,74 %	87,65%	83,52%	86,19%	89,03%	89,9%
	Margin of Error	1,57%	3,43%	3,54%	3,61%	3,61%	3,61%	4,21%	4,43%

Source: Set by the researcher

3-2-2- Estimation of the E-booking Average « I_t » and the E-booking Cancellation Average « R_t » in Algeria, from 2015 to 2022

In order to estimate this average, we use the language « R », and make the following steps:

3-2-2-1- Removing the General Trend of the Two Series

We remove the "general trend" « $T(t)$ » and the "seasonal variations" « $S(t)$ » of the two series using the « R » programming language, as shown in the annex 03, in which we notice that the curve representing the time series of the booking average shows the existence of a general trend (linear trend) without seasonal variations. Using the « R » language, we remove this general trend of the series, as shown in the annex N° 04.

3-2-2-2- Calculating the Correlations and the Partial Correlations of the Two Series

After removing the general trend and the seasonal variations of the two series, we calculate the correlations and the partial correlations using the « R » programming language. The results are shown in the following table:

Table (05): Correlations and partial correlations of two series of E-booking Average « I_t », and E-booking Cancellation Average « R_t »

Years		2005	2006	2007	2008	2009	2010	2011	2012	2013
E-booking Average « I_t »	**Correlations**	0,02	-0,07	0,09	0,09	-0,12	-0,36	-0,11	-0.00	0.05
	Partial correlations	0,02	-0,07	0,10	-0,13	-0,34	-0,15	-0,04	0,09	-0.10
E-booking Cancellation Average « R_t »	**Correlations**	0,12	-0,01	-0,04	-0,04	-0,26	-0,19	-0,06	-0,01	-0,00
	Partial correlations	0,12	-0,03	-0,04	-0,04	-0,25	-0,14	-0,05	-0,03	-0,09

Source: Set by the researcher using the programming language « R ».

3-2-2-3- Determining the Order of the Corresponding Models of each Series: So that we to determine the order of the model « *ARMA* » corresponding to each series, we use the criterion «AIC» shown in the relation (12) and representing the function of the variables « p, q ». We determine the minimal boundary value of this criterion after making all possible combinations, as follows:

$$AIC(p,q) = \log \hat{\sigma}^2{}_{\varepsilon}(p,q) + \left(2(p+q)/T\right) \ldots\ldots\ldots\ldots (12)$$

Given that: T **:** the number of values of the times series;

p **:** the Order of the model « AR »;

q : the order of the model « MA »;

$\hat{\sigma}^2{}_{\varepsilon}$ **:** the experimental contrast of the white noise (random variations).

So, we get the results given in the following table:

Table (06): Estimated values of the series of E-booking Average « I_t », and E-booking Cancellation Average « R_t »

	E-booking Average « I_t »		**E-booking Cancellation Average « R_t »**	
	Coefficients of the model «AR»	**Coefficients of the model «MA»**	**Coefficients of the model «AR»**	**Coefficients of the model «MA»**
Estimated coefficients	φ_1	θ_1	φ_1	θ_1
	0,6199	- 0,5481	0,1242	-0,0092
Error probability	1,3933	1,4743	2,1922	2,2200
Contrast « $\hat{\sigma}^2{}_{\varepsilon}$ »	9,531		5,455	
Criterion «AIC»	53,84		48,82	

Source: Set by the researcher using the programming language « R ».

From the table above, we find that the order the model « *ARMA* », corresponding to the series of E-booking Average « I_t » is (1,0,1), and that the order of the series of and E-booking Cancellation Average « R_t » is (1,0,1).

3-2-2-4- Estimating the Rate of E-booking Average and the Rate of E-booking Cancellation Average of the Period of Prediction

Through the substitution of the estimated coefficients, as shown in the table above, equation (22) in the annex (05), we obtain the equation (15) and (16) of the E-booking Average and Rate of E-booking Cancellation Average respectively:

$$X(t) - \varphi_1 X(t-1) = \varepsilon(t) + \theta_1 \varepsilon(t-1) \ldots\ldots\ldots\ldots\ldots\ldots (15)$$

$$X(t) - \varphi_1 X(t-1) = \varepsilon(t) + \theta_1 \varepsilon(t-1) \ldots\ldots (16)$$

So, we obtain the results shown in the following table:

Table (07): Estimated amounts of the Rate of E-booking Average and the Rate of E-booking Cancellation Average

Years		**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
E-booking Average « I_t »	**Amount**	25,53%	24,55%	23,76%	22,87%	22,03%	21,16%	20,31%	19,44%
	Margin of Error	3,03%	3,09%	3,09%	3,09%	3,09%	3,09%	3,09%	3,09%
E-booking Cancellation Average « R_t »	**Rates**	33,36%	33,76%	34,16%	34,56%	34,96%	35,36%	35,76%	36,16%
	Margin of Error	2,33%	2,35%	2,35%	2,35%	2,35%	2,35%	2,35%	2,35%

Source: Set by the researcher

3-2-3- Estimating the Amount of Loss during the Period 2015-2022

After calculating the tourism incomes, the Rate of Organised Foreign Tourism, the Rate of E-booking Average and the Rate of E-booking Cancellation Average estimated from 2015 to 2022, we make a substitution in the equation (11), and obtain the average of losses « P_{NTIFt} » during the period of prediction, from 2015, to 2022. The results are displayed in the following table:

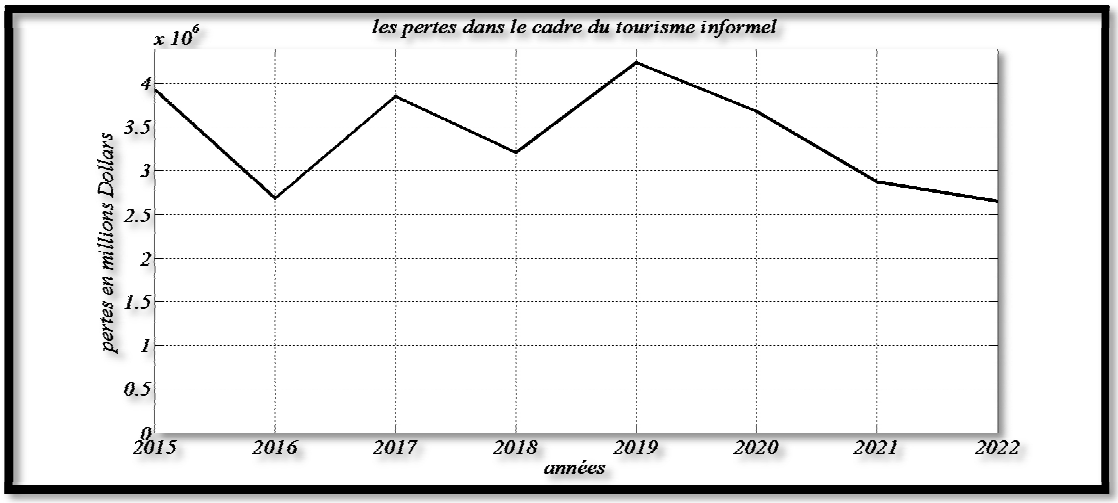
Table (08): Estimated of the Financial Losses during the Period 2015-2022 in Algeria

Years	M_{At} (million $)	R_t	I_t	i_t	P_{NTIFt} (million $)
2015	546.36	%33.36	0.2553	%83.29	3.9325
2016	585.57	%33.76	0.2455	%88.98	2.6874
2017	598.92	%34.16	0.2376	%84.74	3.8551
2018	634.81	%34.56	0.2287	%87.65	3.2102
2019	646.74	%34.96	0.2203	%83.52	4.2440
2020	679.88	%35.36	0.2116	%86.19	3.6845
2021	690.79	%35.76	0.2031	%89.03	2.8763
2022	721.63	%36.16	0.1944	%89.9	2.6544

Source: Set by the researcher using the database obtained from the Ministry of Tourism and Craft Industry, and the database obtained from the results of the questionnaires.

From the table above, we can notice the volume of financial losses (in hard currency) undergone by the national economy in the context of unorganised foreign tourism because of the high e-booking cancellation by the foreign tourists. These losses are shown in the following figure:

Figure (04): Representing the Estimated of the Financial Losses during the period 2015-2022 in Algeria



Source: Set by the researcher using the programming « MATLAB »

From the figure above, we deduce that the volume of financial losses (in hard currency) that will be undergone by the national economy because of continuous resort to the foreign tourism companies and e-booking systems will be increasing from year to year. These losses will (according to our estimation) shift from approximately 4.244 million USD in 2014, to be around 4.2440 million USD of the total tourism incomes in 2019. The total of these financial losses for the period 2014-2022 will exceed 27.1444 million USD, representing losses in hard currency for the national economy. Inversely, the tourism balance surplus will not exceed 13 million USD. This financial loss is considered as a deduced portion of the absolute (confirmed) tourism market.

4- Results and Recommendations

The use of information and communication technology in Algeria has contributed in an efficient manner in the maximization of the potential tourism market. Thanks to this technology, a great number of tourists using the Internet may be incited to book tourism services supplied by the tourism companies, which can promote their

tourism offers using this technology. This has enabled the said companies to expand their customer base, to improve the organisation of their tourism industry, and encouraged the spread of e-commerce practices in the national economy.

However, this efficiency remains relative because of the absence of an intersectorial approach between the sectors of tourism and banking in matters of e-payment in the context of a hard competition between the world States to attract new tourists. This state of things has had a negative impact on the satisfaction of the tourists using the Internet, mainly the foreign one. It has also particularly negatively affected the confirmed tourism market of the Algerian tourist destination, and the national economy as a whole. This is due to the big financial losses (in hard currency) undergone by the national economy in the context of unorganised foreign tourism. The said financial losses have attained, in the period 2005-2014, 28.4672 million USD (according to our estimation), because of the high e-booking cancellation by the foreign tourists in the context of the absence of e-payment at the national level. The total of these financial losses for the period 2015-2022 will exceed (according to our estimation) 27.1444 million USD if the matter is not redressed and if things remain what they are.

On the basis of these results, we recommend what follows:

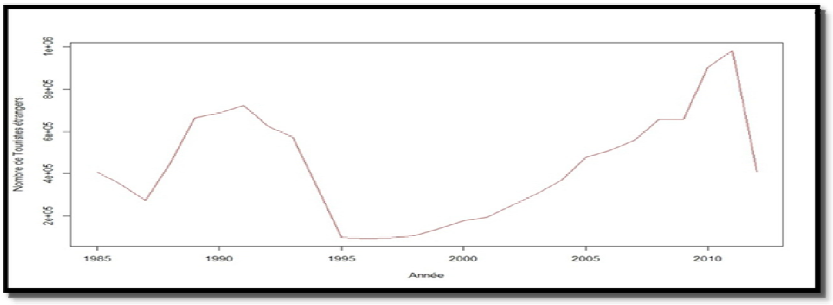
First: It is necessary to speed up the realisation of a intersectorial approach between the sectors of tourism and that of information and communication technology, so that an effective information base may be established, consisting in an e-tourism portal. Such a portal is, in fact, the bedrock of development and organisation of e-tourism in Algeria;

Second: It is necessary to speed up the implementation of an intersectorial approach between the sectors of tourism and banking, so that the e-payment system may be applicable in tourism. The e-booking system may, in fact, help gaining more hard currency, on the one hand; and develop the Algerian tourism destination, on the other hand;

Third: It is necessary to implement cooperation (intersectorial approach) between the sectors of tourism and commerce, in order to establish a legal a regulatory framework for the application of e-payment system in Algeria, so that the aims of all the parties concerned with this approach may be achieved.

5- Annex

5-1- Annex 01: Represents the series of tourism incomes after the removal of the general trend



5-2- Annex 02: Represents the series of Rate of Organised Foreign Tourism « i » before and after the removal of the general trend.

Figure 06: : Represents the series of Rate of Organised Foreign Tourism after the

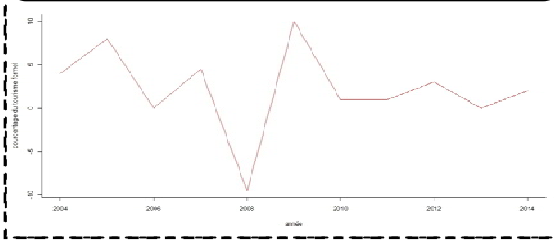
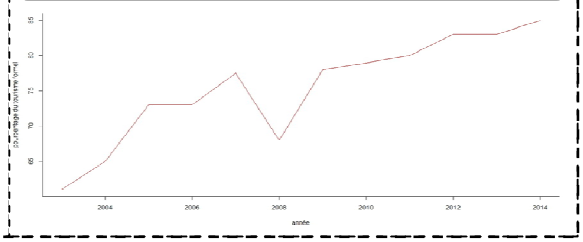


Figure 07: : Represents the series of Rate of Organised Foreign Tourism before the



5-3- Annex 03: The Series of E-booking in Algeria before and after Removing the General Trend

Figure 08: Represents the series of Rate of

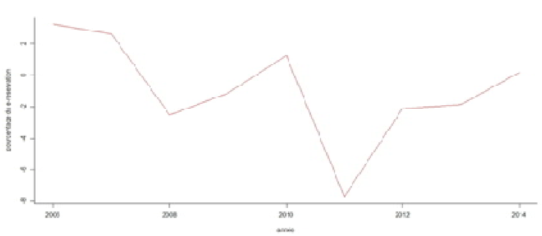
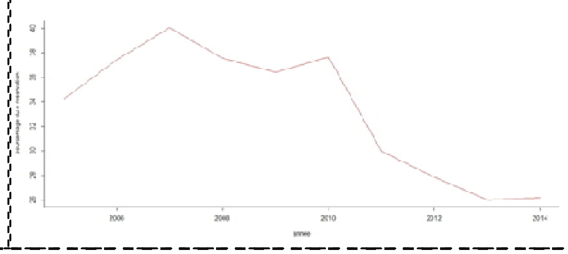


Figure 09: Represents the series of Rate of



5-4- Annex 04: The Series of E-booking cancellation in Algeria before and after Removing the General Trend

Figure 10: Represents the series of Rate of E-booking cancellation before the removal

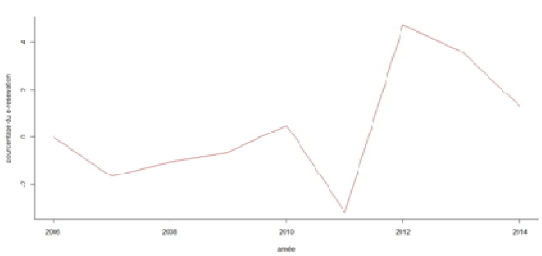
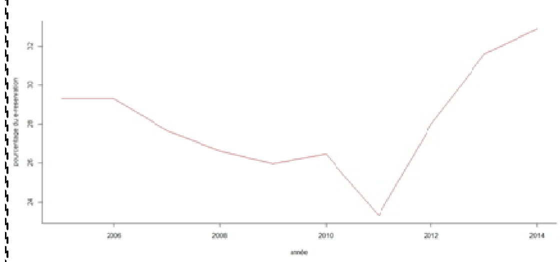


Figure 11: Represents the series of Rate of E-booking cancellation after the removal of



5-5- Annex 05: Mains components of time series

The time series contain the seasonal variations, general trend and random variations, as bellow:
Cyclic variations: are variations that repeat in a cyclic manner in the same year, and repeat in a similar manner from year to year. They are symbolized in "St". In a way if "P" is the cycle, we obtain the equation (17).

$$S(t+kp) = S(t), \forall K \in N^* \text{.......... ....} (17)$$

t: represents time / **K**: represents the period of prediction

General Trend of the Time Series: it expresses the trend of the time series. It can be noticed through the curve graph of the time series. It is symbolized in the equation (18):

$$B(X(t)) = X(t-1) \text{.......... ....} (18)$$

Random Variations (white noise): These are instable variations that can not be predicted. They translate the effects of random factors that come with time. They are symbolized in the equation (19)

$$\nabla dS(t) = S(t) - S(t-d) \text{.......... ....} (19)$$

AR Model: autoregressive model. We consider a series as an AR(p) model if it is of the form in the following equation (20):

$$X(t) = \varepsilon(t) + \sum_{k=1}^{p} \varphi_k X(t-k) \text{.......... ....} (20)$$

$(\varepsilon(t))_{t \in Z}$: it is the white noise (random variations). Its average is null. Its contrast is $\partial_{\varepsilon}^{2}$; p is the order of the model

MA Model: Moving-average model. This model is called "Moving average". We say that a series is of moving average model if it is of the form in the equation (21):

$$X(t) = \varepsilon(t) + \sum_{j=1}^{q} \theta_j \varepsilon(t-j) \text{.......... ....} (21)$$

ARMA Model: autoregressive-moving-average model. We say that an equation is of ARMA(p,q) model, if it has the form of the equation (22):

$$X(t) - \sum_{k=1}^{p} \varphi_k X(t-k) = \varepsilon(t) + \sum_{j=1}^{q} \theta_j \varepsilon(t-j) \text{.......... ....} (22)$$ $\varphi_1, \ldots, \varphi_p (\varphi_p \neq 0)$,

$\theta_1, \ldots, \theta_q (\theta_q \neq 0)$: are coefficients that are estimated, $(p, q) \in N^2$ And X are the dependent variable. **T**: is the independent variable**.**

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