Impacts of Sky Liberalization options on Tourism Market Dynamics: Case Study of Tunisia

Karim Kammoun[1], Aymen Ghédira[2-3], and Imen Ayoub[4]

[1]University of Sfax, the Higher Institute of Industrial Management of Sfax, Tunisia

[2]Université de Tunis, School of Economics and Commerce, DEFI Laboratory, Tunisia

[3]University of Sousse, Higher Institute of Transport and Logistics, Tunisia

[4]University of Sousse, Higher Institute of Transport and Logistics, Tunisia

ABSTRACT: The positive impact of the liberalization of air transport, largely supported by the economic theory and "validated" by the empirical studies, has inspired many developing countries to liberalize some of their Air Service Agreements (ASA). After Nigeria and Morocco, Tunisia has signed in December 11th, 2017 the agreement of Open Sky with the European Union (EU), its historic economic partner. Thus, the Tunisian airlines will be exposed to key issues emanating from both the agreement and the activation of the Yamoussoukro Declaration signed more than 15 years ago. Given these potential deep conditioning mutations, in the future Tunisian air transport, this paper will attempt to predict and compare the dynamics of air demand in Tunisia from the initiation of both agreements. The aim of our work is to qualify the effects of the Tunisian-EU Open Sky and Yamoussoukro agreement based on the reproduction of passenger traffic Reference situation marked by its restrictive character, using macroeconomic factors (trade and GDP), the distance and the ASA liberalization indicator to build our econometric model. The comparison will be justified by a working simulation of various liberalization options.

KEYWORDS: Air Service Agreements**;** Liberalization; Open Sky; Tourism; Yamoussoukro Accord.

1   INTRODUCTION

Transport services are provided in a structure of a network of bilateral agreements. An agreement of this type makes some airlines capacity and frequency of -service restricted, which subsequently causes an increase in costs and prices [1]. These agreements are suitable for protecting the national flag. Tourism has often been a constraint of the binding international regulations of aviation [2]. On the other hand, aviation has always been defined as the key to international tourism, particularly on the long-distance and guide to island destinations (Button and Taylor, 2000). There is considerable evidence that the liberalization of international markets has brought substantial benefits for passengers and the economy in general. A study of the single market of the EU aviation showed that it significantly increased competition on many routes, [3] gave rise to many more new routes of exploitation, and led to a decrease of 34% of the rates in real time. Another study showed that the liberalization of the EU market has doubled the rate of growth of air traffic in the EU [4]. In addition, other studies showed a link between the increase in the flow of air and the growth of employment and Gross Domestic Production. For example, a recent study has estimated that every 10% increase in international air services leads to an increase of 0.07% of GDP, which can be translated into millions (or even billions) of dollars of GDP. Overall, the liberalization has promoted a service of air transport and better quality at a high price. Mentioning the example of the American sky liberalization, which has led to a considerable cost decline of air travel for users and clear improvement of services on planes and in airports and the proliferation of airlines and destinations served. It has finally opened the rest of the world to

a population which could not previously afford. Policies put in place in the United States, India, Europe, and between the United States and the EU showed that the liberalization of air transport has significant economic and social benefits:

- The decline in rates allows travelers to save most of their income;
- The creation of airline companies and the increase in traffic at the airports create jobs. These two factors contribute to the growth of GDP, to development and to the fight against poverty. On the Tunisian front, however, the first benefit expected from the Open Sky is an increase of traffic between Europe and Tunisia coupled with the appearance of new actors and the opening of new lines. The second benefit is a reduction in tariffs under the effect of increased competition [5]. The more aviation standards improve, the more there is support for tourism development, trade and economic integration in the Euro-Mediterranean area.

2   DEGREES OF OPENING OF THE MARKET OF AIR TRANSPORT IN TUNISIA

A bilateral air agreement constitutes the legal framework governing air relations between two countries on a plan that safeguards the interests of both parties. These agreements concern scheduled air services, of which the main clauses are those relating to the appointment of the companies, the capacity offered by the airlines to air fares, to the transfer of revenue surplus, to the safety of Civil Aviation, and to the schedule of the air and traffic rights. The Minister of transport, and like all the experiences of the deregulation of air transport and the opening of the air spaces around the world, Tunisia has opted for a progressive gradual liberalization, and an orderly air transport at the national and international levels: 76 air agreements preserve the interests of the national flag. Those exploited (currently 38 agreements) guarantee the national Pavilion 56.5% of the traffic in each market (on all lines, the part of Tunis air in regular traffic amounted to 55.1% in 2011). Most of these agreements have undergone one or more amendments with a view to adapt the provisions of these agreements to the evolution of the airline industry. These amendments are introduced following bilateral aviation negotiations.
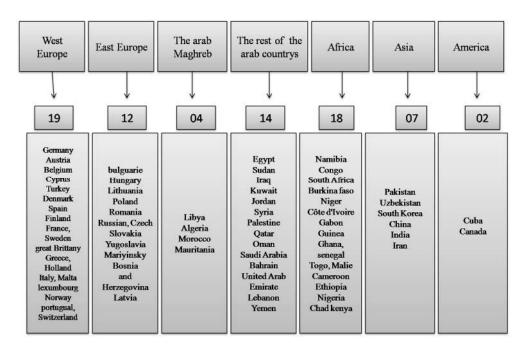

Figure 1: The agreements concluded by Tunisia.

According to ICAO 40, bilateral air service agreements are recorded by Tunisia and main countries in Europe, Africa and the Arab world. However, these agreements are traditional and restrictive and no agreement 'open sky' was recorded. In fact, these restrictive agreements do not allow free access to markets for foreign airlines. Over 40% of international traffic is done by the charter companies. As a conclusion, Tunisia can benefit from 3 frames of statements [6] Yamoussoukro Declaration, open-air, and Arab League European Neighborhood Policy (ENP). ENP has been so far the main driving force of the liberalization, on the one hand, to develop a plan and a roadmap for transport near the European Union and on the other hand, for a single European space in transport. The ENP also proposes an extension of transport of the EU and the policy of infrastructure of its neighbors and the liberalization of the markets of third world countries in the transport services. The Draft agreement on the opening of the Tunisian sky initiates with the Maghreb, Europe and North America. Meanwhile, the Tunisian

sky is fully open to international flights. Air transport has already been fully open between Tunisia, Morocco and Libya, meaning that the airline companies of these three countries have free access to the skies of each other. Mauritania is on the track to join. About Europe, the draft agreement was submitted to the Tunisians on the liberalization of air transport rights, passengers, goods, deregulation of rates, and consolidation of cooperation on air navigation. These things are done with Canada which signed a post-agreement as well as with the United States. It is essential to note that decryption of some statements of Ministers of transport (from the year 2011 to the present) has led to deduce that protectionism is still required in air transport and suggests that the entry of new airlines to the Tunisian market is still regarded as a threat to the Tunisian Pavilion, and in the first place to Tunis air. However, a statement of the Minister of transport noted that the national carrier Tunis air is not originally delaying in the open Sky, pointing out that this concept is a strategic choice on which Tunisia will not return. It states that the Open Sky will allow the change of air navigation and the flow of goods. Moreover, the Ambassador of the European Union (EU) in Tunisia, Laura Baeza, said that the agreement negotiated between Tunisia and the EU is an agreement which is not only the opening of the market, but also the relaxation of barriers to investment in airlines, comprehensive cooperation and regulatory convergence. This agreement, she added, will develop air traffic by liberalizing traffic rights. Moreover, despite the large number of bilateral agreements concluded between Tunisia and the EU member countries, several constraints are imposed on the airlines of both parties. Baeza also said that the agreement will ensure air transport between the two shores under good conditions, by the approximation of the security laws between the two sides such as economic regulation, including competition, air traffic control and the protection of the consumer. She said that the EU's objective is to double the number of tourists visiting Tunisia from 6 million in 2013 to 12 million in 2020, adding that the potential of the Tunisians living in Europe represents significant challenges for the Tunisian companies. In this sense, liberalization can have beneficial effects such as:

- The reduction of the cost of transport and the promotion of international business.
- Job creation after the setup of new airlines.
  The improvement of the low technical service not to say non-existent in Africa, which would probably be the most beneficial effect.

For Tunisia, bilateral agreements cause restrictions regarding the potential customer of several orders, such as rigidity of the tariffs, congestion of the flights in the high season, lack of frequencies and limitations of cities served.

Therefore, hoteliers and Tunisian travel agents claim the opening of the sky which, according to them, would bring many more tourists to Tunisia thanks to a significant decrease in the price of air transport and the development of the offer. Thus, Tunisia must take the step to change the restrictive policy towards a more open strategy since it embodies a destination being geographically close to Europe; Narjess Abdennebi said "there will be a relaunch of a new application and the creation of opportunities for tourism thanks to the catalytic effects of the Open Sky". Moreover, Kamel Ben Miled stated that "everyone must find his interests within the framework of a smart win-win agreement". For Richard Soubielle, one "should not be afraid of the Open Sky adding that a defensive strategy is useless". "On the contrary, we should prepare the project with pugnacity and adopt an offensive strategy". He also suggested that "airlines must put their hands in the sludge" and that "travel agents must now organize themselves around this reality."The airline Tunisair wants to launch 25 new routes in four years, including 20 in Africa, hoping to make it profitable especially with the medical tourism market.

In fact, the African organization has agreed to support Tunisia for obtaining rights in accordance with the fifth freedom of air law, in the context of the liberalization of the air transport agreement between the African countries. Because of deregulation made in the United States, Europe...; the African Ministers of civil aviation meeting in Yamoussoukro in 1988 had adopted a declaration on a new African aviation policy. The Declaration was the integration of African companies, notably through the establishment of new joint bodies, the strengthening of existing community structures, and the development of the exchange of traffic rights.

The Decision aimed at the creation of conditions for the emergence of a reliable air transportation quality, responding to the imperatives of integration of the continent. The Yamoussoukro Decision came fully into force in August 2002 but still not practical. The economic prosperity and the growth of traffic are the consequences of this policy. Tunisia is a member signatory of this declaration which constitutes a development opportunity except that the latter is still inactive because of a refusal from the African partners who are at risk of the emergence of our companies in their market. Traffic increases could have effects of safe exercises for airline tickets, revenue, costs and competition. The objective is to overcome the obstacles of liberalization and flow to a very efficient market. In conclusion, Tunisia faces two strategic choices: the first is the activation of the YD, the second, which is still a project, is the doubt about the future of the Tunisian aviation.

3 DATA AND METHODOLOGY

The approach to the study of the impact of liberalization may be either qualitative or quantitative, inserting the time series with econometric methods or models of causation. According to Grancay [7], the causal models, which are models of gravity and multiple regressions, are relevant provided that the traffic of peer countries data is available. Referring to InterVISTAS-ga2 [8], the modeling approach of a cross-section shows that economic factors (GDP, the level of trade and geographic variables) are the necessary determinants of traffic between a pair of countries. Therefore, there is interest in this chapter to apply a cross-sectional regression model in determining the relationships between the variables. Referring to the Nigerian case, the deregulation of the global air transport industry inspired Nigeria to reformulate its civil aviation policy and to negotiate more liberal bilateral agreements with several countries. A repository document of the Nigerian case well examines the adverse effects of liberalization as the flight of capital, and the projection of the considerable growth of traffic demand, which is a solution that could alleviate the problem of underutilization of air transport infrastructure in Nigeria. There is evidence that this country has exceeded the obstacles of liberalization and circulates to compete effectively in the international market via the OS and YD that appears most advantageous in this case. Our model was estimated using a database in cross-section from 41 countries in relation to Tunisia. The relationship between the variables can be linear or curvilinear. As mentioned previously, the research focuses on the 2010 and 2012 periods. Currently, Tunisia has signed officially Bilateral Air Services Agreements (BASA) with 36 countries for international air traffic. These agreements are generally of restrictive nature to a target of protectionism [9]. In addition, [10] stated that the essence of the restriction of BASA is to protect the interests of indigenous carriers in the markets of the countries. However, the air transport of Tunisia presents a distinct environment with a low native of companies that do not have the financial capacity and the good management of competition in an efficient manner with international carriers. This gap of weakness helped competitors to enjoy and manage 46.2% of international air traffic on the market in 2013.The multiple regression model operated in our study expresses the demand of air traffic (dependent variable) between Tunisia and the sample selected based on geographical, socioeconomic and regulatory factors (independent variables).

The original form of this equation is that the marginal effect of each variable depends on the value of the other variables in the function of the application:

$$\text{Traffic} = \beta_0 + \beta_1 \text{GDP}_{AB} + \beta_2 \text{Trade}_{AB} + \beta_3(\text{ALI}) + \beta_4 \text{FARE}_{AB} + \beta_5 \text{DIST}_{AB} + \beta_6 \text{Dummy (1,0)}_{AB} \qquad (1)$$

For variables GDP, ALI, DIST, the Dummy is respectively identified as follows:

Air Liberalization Index (ALI$_{AB}$): is an index of the liberalization of air transport between pairs of countries based on the standard scale of the WTO. It is the sum of the points obtained by an air service agreement.

GDP$_{AB}$: Global GDP between two countries. The calculated method of the parity of purchasing power, measures the total magnitude of the economic activity in all the countries. The specification assumes that changes as GDP in each country as a pair of countries will have identical influences on the level of traffic. GDP proved the most important exogenous variation in terms of importance and explanatory power. The data on GDP are contracted from the World Bank "World Development Indicators".

FARE$_{AB}$: This is the average price of a ticket for an economy class between two countries. Due to the inaccessibility of the data, we are interested in the following approach:

Let's take a national company of each country which determines the price of a return ticket to the destination agreed for two less remote periods (January 2015 and March 2015). Subsequently, it calculates the average price divided by the exchange rate average in the U.S. dollar for the year 2010 and 2012.

Trade$_{AB}$: This is the international annual value of trade between peer countries. Our database is the African Bank of development where there is commercial exchange of Tunisia with its different partners (import and export). Due to the invalidity of data for 2012, we worked on the estimation of trade based on the following procedure:

The growth of trade is not constant from one year to another and at a variable rate; therefore, we calculated the annual growth rate (for a five-year interval) and selected the highest rate to apply it:

$$X_{2012} = (1+T) X_{2011} \qquad (2)$$

With T: Annual growth rate chosen

Dummy (1.0)$_{AB}$: this is a binary variable for a cultural link or common language between countries (equal to 1 if there is a common sharing of language /culture with Tunisia and 0 if not).

Data relating to the traffic of passengers, GDP and total trade had been transformed into the logarithmic form of the following equation:

$$\text{Ln(Traffic)} = \beta_0 + \beta_1 \text{LnGDP}_{AB} + \beta_2 \text{LnTrade}_{AB} + \beta_3 (\text{ALI}) + \beta_4 \text{FARE}_{AB} + \beta_5 \text{DIST}_{AB} + \beta_6 \text{Dummy}(1,0)_{AB} \qquad (3)$$

The information on air service agreements has been transformed into quantifiable values using the ALI index developed by experts in the industry [11,12]. Therefore, the components of the ASA have been assigned a weight from 0 to 8, where 0 indicates the most restrictive measure and 8 the most liberal indicator according to the different characteristics of an agreement on air service:

- Rights granted (3rd and 4th, 5th, 7th, coasting trade: right to freedom),
- Tariff causalities (Double approval, country of origin, disapproval, tariff Zones, free pricing)
- Designation (single, Multiple)
  Refusal (substantial ownership and effective control, community of interest, Principal place of business)
- Ability (prior Determination, another restrictive Covenant, Bermuda I, another liberal clause, free determination)
- Statistics (exchanged, not exchanged)
  Arrangement of cooperation (authorized, not authorized).

The research used the ordinary least squares method and the XLSTAT software and followed a step-by-step the procedure that enables to select the most important independent variables from any set of variables, while excluding the variables including an insignificant impact on the dependent variable [13].

4 RESULTS AND DISCUSSION

4.1 STRUCTURE OF BASA AND LEVEL OF LIBERALIZATION

The air service agreements signed by the Tunisian Government are classified into four types to better explore the measures of ALI. According to [14], the types of agreements to be discussed in the next section are: BASA restrictive, BASA with a trade agreement, Declaration of Yamoussoukro (DY), and Open Sky (others say that Tunisia will come to a complete agreement by 2016) except for Tunisia as already mentioned that practice restricts bilateral agreements. We limit ourselves to: BASA restrictive, DY and the Open Sky.

It is known that the common instrument of the international regulation of air transport between two countries is BASA as [10] and [15] submitted. In addition, BASA is designed to protect national interests and provide support to the national flag. Many in the industry have shown the impact of the policy of these amenities in the aviation industry, taking the example of [16] who stated that the regulation has succeeded in creating a regular company strictly protected from competitive pressures leading to inefficiency, high rates, poor service quality and reduced profitability. In addition, [17] concluded that a bilateral regulation hinders the development of air transport because of extremely protectionist policies in controlling a case in Africa. As a result, BASA could be the first Manager to restrict a solution of aviation on the international market, which causes an increase in costs for the operators as well as for customers and subsequently creates the inefficiency of the market [14].

In addition, Button and [18] applied the approach that BASA limit capacity and rates in international trade between countries so that liberalization policies tend to remove the limitations of capacity and rates resulting in the emergence of new entrants that create competition. To sum up, they indicate that the path of the intensification of traffic leads to the reduction of the cost per passenger, which enhances efficiency continuing the path of implementing the policy, causes a more integrated quality of service, such as the concentration of traffic, sharing code, loyalty programs. The increase in the level of quality of service results in a decrease in inducing costs to strengthen the demand for international air travel. This suggests that the policies of liberalization (Open Sky and the Yamoussoukro Declaration) lead to reducing the operating costs and to increasing the number of passengers.

4.2 CALIBRATION AND MODEL DEVELOPMENT

The co linearity of the common variables is presented by the correlation matrix where traffic is positively correlated with the GDP, trade and ALI. The latter represents the most important variable that can be exploited to determine the development of the bilateral agreements. The table following the demanding relationship between traffic, GDP, trade, ALI and Dummy justifies the taking of these variables in the model while the significance of distance and the ticket price are

negative. This shows a strong co linearity of traffic to these variables which will subsequently be tested to estimate their reactivity on the global passenger traffic.

Table 1: Correlation matrix.

Variables	Ln(GDP)	Ln(Trade	Ali	Dummy	Dist	Fare	Lntraffic
Ln(GDP)	**1**	0,749	0,029	-0,273	0,089	-0,29	0,473
Ln(Trade)	0,749	**1**	-0,066	-0,12	-0,289	-0,273	0,553
Ali	0,029	-0,066	**1**	-0,144	-0,242	0,197	0,074
Dummy	-0,273	-0,12	-0,144	**1**	0,013	-0,149	0,05
Dist	0,089	-0,289	-0,242	0,013	**1**	-0,053	-0,435
Fare	-0,29	-0,273	0,197	-0,149	-0,053	**1**	-0,16
Lntraffic	0,473	0,553	0,074	0,05	-0,435	-0,16	**1**

The importance of the ALI variable determined by the model on which oriented the definition liberalization requires the types of agreements concluded with Tunisia and the signatories whose objective is to determine the rate the ALI weighed according to the characteristics of each approval. The weighing of ALI for these countries, according to the type of agreement, is signed and defined by « part A of QUASAR ». The distribution of weights by specific criteria of understanding confirms that Tunisia still has a well BASA restrictive practice. Although some agreements have the freedom of the 5th law (with Germany, Turkey, Russia), the trial of officials of civil aviation in Tunisia insists that Tunisia will open its skies only for Libya and Morocco. The definition of the types of bilateral agreements with Tunisia allowed us to calculate the overall ALI of Tunisia by type of agreement.

The estimate of ALI on the bone and YD is based on the identification of the criteria for the rights of freedom and the weighing factor to take. Global ALI may be unveiled at the table that Tunisia provides a global ALI which is worth only for which is the restrictive regulation of its agreements with most countries, a most important ALI of 26 bones and a higher 30 YD ALI. Forecasts tend toward these two BASA with the largest ALI. The range of analysis of traffic based on the influence of the explanatory variables is demonstrated by table 2. Research compares the results of each of the two years 2010 and 2012 to ensure the validity and reliability of the model. Variable distance was chosen because it is statistically significant and contributes a value of – 3.144 ($p < 0.05$), more ticket tariff contributes a (0.164) value between 0 and 1 with $p < 0.05$ which justifies its significance. This may be due to the nature of the Tunisian international passengers who are dominated by the companies that have sensitivity to the price. All the coefficients of the variables and other parameters of the regression are strongly correlated to the two samples 2010 and 2012. The values have the expected signs and are significant. Ticket price, which is retained by the two samples, presents a 0.164 in 2010 and -1.285 in 2012 with a p value<0.05 implying that ticket price, whether it's an effect or not, was a limited + the passenger demand. Using the latest model data for the year 2012, the model explains a substantial proportion of the variance in the data with a coefficient of determination R^2 of 50% and a 5.703 F value ($p < 0.05$) expressing the strong association between the dependent and independent variable.

Table 2 : Two multiple regression models 2010/2012

	Variable Dependate Traffic 2010					Variable Dependate Traffic 2012			
	Valeur	Erreur Standarc	T	Pr>[T]		Valeur	Erreur Standarc	T	Pr>[T]
Constante	3,243	2,349	1,381	0,176		6,721	2,15	3,216	0,004
Ln(Gdp)	0,716	0,287	2,493	0,018		0,135	0,263	0,154	0,611
Ln(Trade)	0,005	0,178	0,026	0,979		0,295	0,152	1,942	0,06
Ali	-0,011	0,04	-0,266	0,972		0,002	0,033	0,063	0,95
Dummy	0,787	0,489	1,612	0,116		0,531	0,474	1,121	0,27
Dist	0	0	-3,144	0,003		0	0	-1,618	0,115
Fare	0	0	0,164	0,871		0	0	-1,285	0.207
Observation	41					41			
R^2	0,497					0,502			
R^2 Ajuste	0,408					0,414			

Ticket price, retained by the two samples, presents a 0.164 in 2010 and-1,285 in 2012 with p value > 0.05 implying that the ticket price was an effective limited course on the passenger's demand. Using the latest model data for the year 2012, the model explains a substantial proportion of the variance in the data with a determination coefficient R^2 of 50% and a 5,703 F value ($p < 0.05$) which shows the strong association between the dependent and independent variables. The model also shows the influences of other independent variables. As expected, the number of passengers decreases with distance. It practically has a low coefficient, but its importance lies in the explanation of the passenger's traffic. The small size of the effect of distance reflects the effect of price sensitivity. In addition, the dummy Dummy for the common culture and language has a significant influence on traffic between Tunisia and other countries that use English as an official language. As anticipated, overall GDP and international trade have strong positive associations with demand between countries that are represented by a statistically significant value of t > 1, 96.

It is considered that the importance of the distance as an explanatory variable is equivalent to the parallel effect of the culture/language because the distance between two hypothetical points A and B is higher than the trend of cultural/linguistic barriers. Closest rights, it is more likely to share the culture/language, this is shown by the correlation matrix showing that passenger traffic was positively correlated with the culture/language. It may be have more apply now that the broad culture/language and distance have a strong effect, which gives the distance its importance. Overall, evidence supports the validity of the model which explains the request of international passengers in the country based on independent variables including liberalization. The model is statistically valid because it meets the condition of multiple assumptions of regression to know; t-student, F, normality, linearity test. The model was tested on another sample obtained in 2010. The results show a statistically significant effect in a small way on the liberalization of passenger's traffic (the value of the coefficient is 0.002). Weakness of contribution is the nature of the restrictive and regulated market, but it is used with the aim of estimating the evolution of traffic in the event of market liberalization.
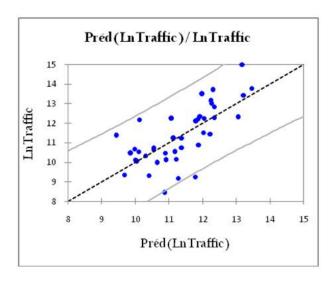

Figure 2: Prediction of traffic.

Traffic regression enables us to visualize the spread of key variables in the confidence interval except two values which are outside. These values are the distance and the price of tickets, which have zero co efficient. The significant variables explain 41% of the traffic variability. The remainder of variability is surely dependent on other variables not included in our model.

4.3   SIMULATIONS OF LIBERALIZATION

The model supported by the following search is that of 2012 to simulate the impact of the liberalization of the country in anticipation of future traffic when the ASA are changed.

$$\text{LnTraffic} = 6,721+ 0,135 \text{ LnGDP} + 0,295 \text{ LnTrade} + 0,002 \text{ ALI} + 0,531 \text{ Dummy} \qquad (4)$$

The most relevant criteria where one can play are ALI which gives a reflection of our goal (liberalization). This model applies to most of the 41 countries, intensive traffic regarding the passenger to / from Tunisia. The impacts of liberalization were assessed to simulate the evolution of the current ASA for the country from a restrictive BASA, an Open Sky agreement

then the Yamoussoukro Declaration. The simulation assumed that all the other things are equal now and constant all the other independent variables affecting the demand for traffic such as GDP and trade, are constant.

The following table shows the variation of traffic estimated from a sample of 18 countries where Tunisia has not yet benefited from YD activation with African countries or from the Open Sky with other countries. Full liberalization of an agreement may take the ALI value up to 50 based on WTO. The study assumes that maximum and acceptable liberalization by Tunisia with the open Sky (ALI 26) and YD (ALI 30).

This table shows actual traffic demand and simulators for each country at different stages of the ASA and the percentage of change in the traffic. The second column shows the current ALI governing trafficking in the country. Column 3 of table (Pax (ALI1)) indicates the real traffic of passengers to and from countries governed by their restricted BASA, namely Algeria, France, Belgium.

These countries ASA did not 5th freedom and limited capacity (frequency), the designation and the property of carriers where the value of the ALI is 4 (A very small value). The model should give a chance to the level of traffic when the ASA of the country is changed to an Open Sky agreement to generate an increase in the traffic of passengers as indicated in the heading (Pax (ALI2)) which is estimated to increase by 53% in these countries (traffic indicated in % in the column of variation1). The model predicts the scenario of traffic for those countries where the regulation is relaxed for an Open Sky and where the 5th unlimited freedom and multiple designation are granted, the capacity is freely determined for any company wishing to increase its frequency bridges or entry points, and where the authorization of an airline to enter into an agreement with another country. Therefore, the increase in the value of traffic is largely comparable with other elements of empirical evidence.

The model refers to the stage of the statement of the Yamoussoukro incorporating all the provisions of the Open Sky added to a liberal policy of support for the property, which leads to a 30 ALI. This is the type of agreement that Tunisia signed with African countries, such as Chana, Egypt. As previously discussed, this research assumes that this stage of liberalization in our country is referential to the Open Sky with the EU. As it was noted, the only difference between the Open Sky agreements and Yamoussoukro is the provision of support for the property, which suggests that the evolution of the Open Sky will be determined by the liberalization and effective control. In our case, Tunisia has the advantage of this declaration which requires just the entry into force by the two partners.

The same for Tunisia study simulated traffic from all countries to this declaration identified as (Pax (ALI3). The results indicate that the volume of traffic for each country has been increasing by 51% (variation 2%). Therefore, the document concluded that the liberalization of ownership of the medium of a Tunisian international road could stimulate the growth of the passenger's traffic on the assumption that other predictive variables hold constant. At the country level, a change from a restrictive air agreement to a bone agreement creates a rewarding attraction of the main countries that open to the bone. The results demonstrated by table 20 explore a demanding attractiveness of Scandinavian countries such as Denmark, with 600%, Sweden, with 548%, Norway, with 524%, as well as French-speaking countries, with a significant rate of 956 percent and Greece with 441%. Other countries, such as Belgium, the Netherlands and Germany have significant rates too.

This totally great significance is due to the convergence of Tunisia to the OS for the first time with liberalized countries. In African countries, OS has registered a decrease in traffic, such as in Morocco (59%), and Algeria (-75%), that returned primarily to the exchange of traffic with those European countries which have a much larger number, compared to the two continents, and Africa. This decline cannot eclipse the increase in traffic with Libya (203%), Togo (485%), Ghana (91%) and South Africa with 15%, which can be explained by the movement with the purpose of education rather than for leisure.

The change from restrictive BASA to the bone is a process that confirms an evolution of traffic exchanged with European countries that are a percentage of variation around 124%. In hand with decrease in traffic exchanged with African countries is reported at a low rate of 15%.

Table 3: Changes in traffic according to the type of agreement

Country	ALI	BR PAX(ALI1)	OS PAX(ALI2)	YD Pax(ALI3)	BR--->OS % variation1	BR--->YD % variation2
Danemark	13	24493	171359	166962	600%	582%
Sweden	13	37117	240455	234284	548%	531%
Norway	13	26007	162179	158016	524%	508%
France	13	75450	788877	768631	946%	919%
Belgium	13	228412	337939	329266	48%	44%
Netherlands	13	177590	341545	332779	92%	87%
Greece	29	34875	188739	189875	441%	444%
Germany	10	954816	1256218	1216655	32%	o7%
Morocco	5	881233	359387	362273	-59%	-59%
Algeria	5	218815	54717	57523	-75%	-74%
Senegal	4	22873	14766	15555	-35%	-32%
Ivoiry	5	38122	15761	16570	-59%	-57%
South Africa	4	85775	98543	103803	15%	21%
Niger	5	30497	15104	15879	-50%	-48%
Libya	10	208003	629521	655212	203%	215%
Ghana	11	43840	83621	86860	91%	98%
Togo	10	11437	66888	69618	485%	509%
Egypte	9	92475	45237	47178	-51%	-49%
Total		3191830	4870858	4826937	52,60%	51,23%

In conclusion, this change leads to record an overall evolution of traffic to reach 53%, which allows asserting that the OS for Tunisia is a factor of tourist selectivity shown by the first category of countries (European market). Therefore, the OS encourages tourists to travel to countries of a higher purchasing power and the interests of more concerted movement. This promotes excellence of tourism quality in Tunisia subsequently resulting in decisive numbers of arrivals.

The encouragement of other traditional nationalities is only a signal for traffic from these countries which will be another purpose of travel limited to educational reasons and work. This encouragement is not decisive enough (15%). The Yamoussoukro Declaration is another opportunity that Tunisia possesses. Its signature will be beneficial for its activation. Moreover, the change from a restrictive BASA towards YD ensures an evolution of traffic around 582% with Denmark, 531% with Sweden, 508% with Norway, 919% with France, 444% with Greece. These percentages are clues to the strengthening of tourism primarily from European countries. In fact, the results recorded by YD are comparable with those of the bone with a slight and insignificant difference. This proves that YD does not prevent Tunisia from taking advantage of tourists coming from European countries. In addition, this chord change promotes 118% of traffic exchanged with Europe reflecting a good significance. The encouragement simulated by the YD declaration allows to slightly increase traffic with certain traditional nationalities by report OS (Niger 48% instead of 50%, Senegal 32% instead of 35%). These signals are significant since Tunisia advances towards by recording an attractiveness of some African countries at the expense of others, such as Libya which will be in evolution of the traffic of 215%, Ghana with 98%, South Africa with 21%. This can be explained by the movement for pleasure, business or study. As a result, YD attracts not only the European countries that appear insensitive to this change, but also a part of African nationalities where their traffic decreases only by 12 %. One should not forget the incomparable difference between the two continents, either in terms of countries or in terms of purchasing power. This is the explanatory reason for the weakness of rates in the African countries (-12%) compared to the European countries (+ 118%). Subsequently a change of the restrictive agreement within the YD enables Tunisia to evolve its overall traffic at around 51%.

It is important to note the bone protruding slightly YD which is due to the only difference concerning the property of carriers and the control of strength which qualifies YD by report OS. Despite this difference, the latter presents a more enhanced influence on air traffic in Tunisia than on YD. Tunisia is founding its profits on African markets. All this helps to explain the smallness of variation between the bone and 0.90% YD. By observing the results, we can simulate the possibility of a change from restrictive BASA to a bone and a YD set that allows to report an increase in air traffic, (as well as tourism as a result), by more than half of referral traffic in 2012. Therefore, it appears to appeal to these two pathways. In fact, the significance of the European economies (% variance is 124%) and African (-12%) has not too much changed. Generally, this change continued to enjoy an increase of 54% of the total traffic. In addition, the study of the simulated model predicts the

impacts on traffic demand when all air service agreements with these countries are changed to Yamoussoukro or the Open Sky. The results show that the level of growth of traffic on the market depends on the nature of the agreement.

5 CONCLUSION

The estimate of the opening of the sky by the "Open Sky" agreement or by "the Yamoussoukro declaration" appears a step performance and especially to inspiring case of Niger (Yamoussoukro) and the Moroccan case (Open Sky). Indeed, the negotiations that take a fear and a doubt at the opening of the Tunisian sky to the European markets can be now neglected according to this simulation, revealing, with excellence, the major advantage to an evolution of air traffic and tourism in parallel through liberalization via the OS and the activation of YD that has become a necessity for achieving the main goal and maximizing earnings.

Table 4 : Estimates of traffic according to the type of agreement followed

	BR--->OS	BR--->YD	BR-->OS+YD
Country	**%Variation1**	**%Variation 2**	**%Variation3**
Danemark	600%	582%	600%
Sweden	548%	531%	548%
Norway	524%	508%	524%
France	946%	919%	946%
Belgium	48%	44%	48%
Netherlands	92%	87%	92%
Greece	441%	444%	441%
Germany	32%	27%	32%
% variation by country category	123,72%	117,90%	123,72%
Morocco	-59%	-58,89%	-58,89%
Algeria	-75%	-74%	-74%
Senegal	-35%	-32%	-32%
Ivory	-59%	-57%	-57%
South Africa	15%	21%	21%
Niger	-50%	-48%	-48%
Libya	203%	215%	215%
Ghana	91%	98%	98%
Togo	485%	509%	509%
Egypte	-51%	-49%	-49%
% variation by country category	-15,28%	-12,41%	-12,41%
% global Variation	52,60%	51,23%	54,07%

Pulling focus on Morocco which benefits as already seen from the OS agreement and which intervenes in the YD and presents a special case. Traffic exchanged with the Moroccan market will have a decrease of 59% at the opening of the sky Tunisia-EU due mainly to increased competition from European airlines. Seeing that the Moroccan market which had experience to find its profit in the European market, the same for Tunisia, the target market becomes systematically other than the Maghreb market. i.e. the European market. However, even with the YD, Morocco reported a decline of 58% traffic due mainly to barriers concerning the bone in Morocco, where foreign companies are more capturing traffic, where the unavoidable traffic decline exchanged between Tunisia and Morocco. It is also important to note the evolution of the traffic exchanged with African countries, like South Africa is qualified by an OS and YD agreement, at the same time, with an acceptable rate. The opening of the European market will certainly influence the Exchange with the Maghreb market and the African market in a closer way. On the other hand, rates saved at the European level can compensate for any reduction at the Maghreb level.

In summary, the overall effects of liberalization on the passenger traffic can be schematically represented in figure 3. If regulated traffic by restrictive BASA if changed to the model Yamoussoukro, could increase it by 51%, 53% in the case of an

amendment to the Open Sky. Similarly, if the traffic regulated by BASA restricted changed to the open Sky and the Yamoussoukro declaration, it might increase by 54% and-0, 90% change from Yamoussoukro to OS.
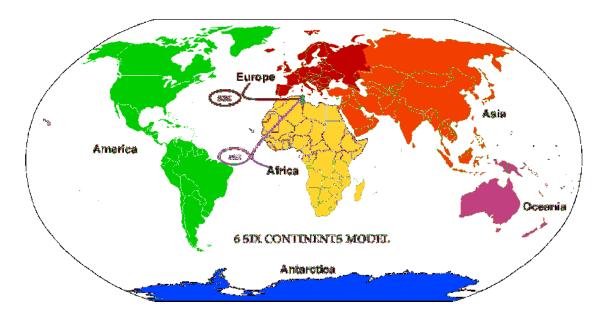

Figure 3: Impact of liberalization on the traffic of passengers with different ASA

Therefore, Tunisia will butter cream through these two agreements which, at this level, have become not essential and motivating. And to better enjoy, it is crucial to learn tips and lessons on the liberalization in the neighboring countries. We can, through this work, demonstrate the benefits to Tunisia by acting on the change of the types of agreements which can be progressive or simultaneous. Indeed, Tunisia does not have the opportunity to create relationships with certain countries based on a liberalized agreement of a commercial nature (Commercial based) to follow progressive liberalization policy through the Open Sky and manage to promote African declaration. The concluded results prove that Tunisia rolls into better channels. In fact, the Open Sky agreement ensures an increase in traffic by 51% and Yamoussoukro by 53%. This latter may be the point of passage and reinforcement to one step of attack towards the opening new perspectives with the EU. "Experience demonstrates that deregulation and the progressive liberalization are sources of substantial benefits from the double perspective of the efficiency of air transport services for the users."(OECD, 1988). The results are optimistic, but the fear of professionals of air traffic around the liberalization of the fifth freedom right expands the level of doubt to the conclusion of this agreement.

REFERENCES

[1]   Zhang Y, Findlay C (2014) Air transport policy and its impacts on passengers traffic and tourist flows. Journal of Air Transport Management 34: 42-48.
[2]   Graham A, papatheodorou A, Forsyth P (2008) Aviation and tourism: implications for leisure travel, Aldershot :Ashgate Publishing Ltd. Tourism and aviation policy: exporing the links 73-82.
[3]   Dobruszkes F (2009) "Does liberalisation of air transport imply increasing competition? Lessons from the European case". Transport Policy 16: 29-39.
[4]   Dobruszkes F, Mondou V, Ghedira A (2016) "Assessing the impacts of aviation liberalization on tourism: Some methodological considerations derived from the Moroccan and Tunisian cases". Journal of Transport Geography 50: 115-127.
[5]   Dobruszkes F (2008) Libéralisation et desserte des territoires : le cas du transport aérien européen, Peter Lang, coll. Action publique 285
[6]   Abdennebi N (2014) Les accords Ciel Ouvert et impact économique Conférence Internationale : Open Sky en Tunisie, Opportunités ou Menaces Pour l'Agent de Voyages.
[7]   Grancay M (2009) "Economic impact of air liberalization" unpublished research paper Munich personnel Re PEC.
[8]   InterVISTAS-ga2 (2006) "The Economic Impact of Air Service Liberalization".
[9]   FMOA (2011) "Nigeria bilateral air service agreement".
[10]   Doganis R (2002) "Flying off Course: The Economics of International Airlines". Routledge, London.

[11] WTO (2006) World Tourism Organization Part A. Présentation Du QUASAR.

[12] WTO (2006) "Second Review of the Air Transport Annex. Developments in the Air Transport Sector (Part Two)". Quantitative Air Services Agreements Review (QUASAR).

[13] Field A (2005) "Discovering Statistics Using SPSS". Sage Publication, London.

[14] Ismaila D, Warnock-Smith D, Hubbard N (2014)"The impact of Air Service Agreement liberalization : The case of Nigeria". Journal of Air Transport Management 37: 69-75.

[15] Vasigh B, Fleming K, Tacker T (2008) "Introduction to Air Transport Economics: from Theory to Applications". Ashgate Publishing Company.

[16] Williams G (1993) "The Airline Industry and the Impact of Deregulation". Ashgate, Aldershot.

[17] Bofinger H C (2009) "An unsteady course: challenges to growth in Africa's Air Transport Industry". Africa Infrastructures Country Diagnostic.

[18] Button K, Drexler J (2006) "The implications on economic performance in Europe of further liberalization of the transatlantic air market". Int J Transp Geogr 19: 1198-1209.