



## The Impact of Open Sky on Airlines Theoretical Study: Case of Tunisia

**GHAZOUANI Nidham**

Research structure: VPNC LAB

**ABSTRACT:** At the level of this article to understand the potential economic effects of an "open skies" agreement, in particular on competition, prices and airline profits. We will try in a first part to determine if consumers will benefit from price reductions following the entry into force of an Open Sky agreement, we will also try to see the effects of "open sky" agreements on competition.

**KEYWORDS:** Air transport, Airline company, Economy, Growth, Industry, Open sky, Trade.

### INTRODUCTION

Over the past decades, we have witnessed significant changes in the international air transport sector, in particular due to the implementation of bilateral "open skies" agreements aimed at liberalizing the air transport sector. However, with regard to multilateral agreements or agreements covering a large number of countries, open skies is a recent concept, which has only existed for a while in a small number of countries.

We seek in this article to understand the potential economic effects of an "open skies" agreement, in particular on competition, prices and airline profits. We will try in a first part to determine if consumers will benefit from price reductions following the entry into force of an Open Sky agreement, we will also try to see the effects of "open sky" agreements on competition. The literature suggests that these effects are positive, increasing the number of companies and the number of flights offered on the routes covered by the agreements (Booz Allen Hamilton, 2007; Fu et al., 2010).

We will reserve the second part for the analysis of the legal and economic aspects as well as the principles of open sky.

### 1: Open Sky in the theoretical literature

#### 1.1. A Theoretical Review of Open Sky Expectations

According to Button (2009), open skies is a concept that emerged in the late 1970s, when the United States began to liberalize the domestic cargo market and the domestic passenger sector. This concept then means the liberalization of airline rules and regulations, with the aim of creating a free market environment for the airline industry, with less state intervention. Open skies agreements include several 'freedoms of the air', so more freedoms will have greater real impacts on the economy (ICAO, 2004).

Since this development in the United States, we have witnessed a gradual liberalization of the international air transport market which has benefited the traveling public (Button, 2009). Obviously, not all open skies agreements have had the same impact or the same importance on the market. Among the most relevant to the functioning of the global economy are the following agreements:

- The "open skies" agreement of the European Union: this agreement consists in liberalizing the air transport market between all the countries of the European Community, giving rise to the "common European air space" (EAEC);
- The "open skies" agreement between the EU and the United States: This agreement has received more attention in the literature because of its broader scope;
- The ASEAN Open Skies Agreement (among ten countries in South West Asia, although there is pressure to extend the agreement to other Asian countries such as India and China) ;
- The open skies agreement between the EU and Canada.

It should also be noted that several countries or blocks of countries are currently negotiating to establish a freer air transport market, as well as many other similar agreements concluded around the world.



In the EU, the implementation of open skies was carried out in several phases: 1987, 1990 and 1993 (Oum and Yu, 1995). It should be noted that in 1987 only twelve countries were members of the European Community. Therefore, this “open skies” agreement is currently much broader and encompasses all members of the European Union.

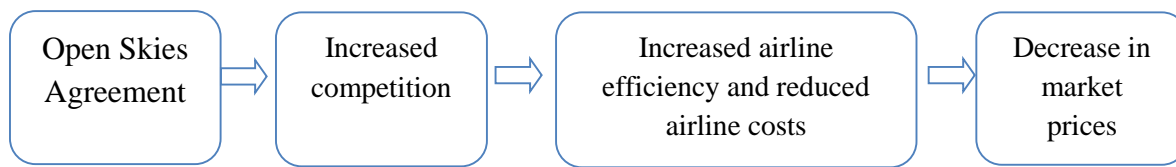
Button (2009) indicates that the opening of the North Atlantic market (through the open skies agreement between the United States and the European Union) is one of the main liberalization measures since the removal of market barriers of the EU. It is therefore very important to understand the effects of this agreement.

Based on international trade theory, the Brattle group (2002) points out that liberalization will increase efficiency and benefit consumers in multiple ways. Also Fu et al. (2010) mention that liberalization allows airlines to face competition, reduce prices and improve quality (eg in terms of frequency of flights).

### 1.2. Open Sky Effects

The existing literature considers that the sequence of effects caused<sup>1</sup>through the implementation of an open skies policy is similar to that shown in Figure 1.

Figure 1: Effects of an open skies agreement



Source: Our Elaboration

#### 1.2.1. Effects on airlines

an "open skies" agreement leads to an increase in the number of airlines in the market, reflecting an increase in competition in the air transport market. This increase reflects the reduction in market restrictions, which should lead to a restructuring of the air transport sector, allowing new airlines to enter liberalized segments of the market.

However, according to Fu et al. (2010), this liberalization should allow airlines to restructure and optimize their networks, thus becoming viable to provide the link between two destinations, which was not possible before due to the low number of passengers using this link.

Restructuring increases the number of possible routes and the number of flights available in a given market (Button, 2009), which increases competition in these market segments.

A study of the effects of bilateral open skies between the United States and its partners, conducted between 1992 and 2007, using a sample of 50,000 routes between pairs of airports, one of which was always a US airport (about 12 observations for each route), Cristea and Hummels (2011) found that the implementation of an "open skies" agreement led to an increase in bilateral air passenger traffic (particularly significant at least five years after the signature of the agreement), which is explained by the introduction of new non-stop routes to the liberalized international market and by the growth of traffic on previously used routes.

<sup>1</sup>For the case of the transatlantic agreement, analyze the effects of "open skies" agreements on service levels in transatlantic aviation markets and measure transatlantic service levels in terms of passenger boarding, number of pairs of cities, departures and number of carriers operating a transatlantic service (the latter can be considered as an indicator of the level of competition in the market).



### 1.2.2. Effects on productivity

According to the Brattle Group (2002), Booz Allen Hamilton (2007) and Fu et al. (2010), a second effect of an open skies agreement will be the improvement of airlines' efficiency and the consequent reduction of their costs. According to these authors, increased efficiency stems from the fact that with liberalization more efficient airlines will replace less efficient airlines or less efficient airlines may behave more efficiently.

For Booz Allen Hamilton (2007), liberalization can lead to productivity gains and substantial cost reductions due to the ability to restructure beyond national borders and the possibility of deeper alliances.

Also Fu et al. (2010) consider that liberalization increases the efficiency of airlines in several ways: the optimization of an airline network and the increased competition that forces the merger or even the bankruptcy of less efficient companies and the adoption of new business models and innovations.

### 1.2.3. Price and demand effects

Some authors (Brattle Group, 2002; Adler and Hashai, 2005; Booz Allen Hamilton, 2007; Pels, 2009; Fu et al., 2010) claim that an "open skies" agreement should lead, on the one hand, to a reduction in price on the liberalized market:

- According to the Brattle Group (2002), this reduction results from increased airline efficiency and a considerable reduction in costs.
- According to Fu et al. (2010), the reduction in prices is due to the introduction of more efficient airline behavior, which in turn results from increased competition.
- 

On the other hand, cost reduction should stimulate price reduction in the liberalized market (Adler and Hashai, 2005, Booz Allen Hamilton, 2007, Pels, 2009). Thus, according to the cited authors, an "open skies" agreement should lead to a reduction in prices resulting from increased competition, reduced costs and increased efficiency. These effects are a well-known result from the literature on oligopoly models.

Regarding airline prices, Cristea and Hummels (2011) found that air transport market liberalization had a small direct effect due to factors such as increased competition or cost synergies caused by the formation of alliances between airlines. These synergies are mainly the result of better coordination of services, through the restructuring of the networks.

These authors also found strong evidence that open skies agreements were associated with increased demand for international flights, which is indicative of improved service quality through increased flight frequency or better coordination of flight schedules.

Changes in the regulation of the air transport sector require time for international markets to adjust and reach new levels of equilibrium. Thus, airlines will need time to reorganize their networks (Cristea and Hummels, 2011). Also, the effects mentioned above are not automatic.

Several factors may hinder the realization of these effects, such as: certain strategic behaviors that incumbents may adopt with the aim of preventing the entry of airlines into the market (e.g. code-sharing agreements (Brueckner, 2001), structuring of networks and loyalty programs (Agarregabiria and Ho, 2010)), natural monopolies (Agarregabiria and Ho, 2010), limited airport capacity (so that not all airlines can start their flights at same time) (Barbot, 2004).

## 2: Highlighting and Aspects of Open Sky

### 2.1. Highlighting the Open Sky

#### 2.1.1. Highlighted in the World

In recent years, in the global aviation industry, there have been several horizontal integrations, in which groups of airlines have been created in the form of strategic alliances as "a close, long-term, mutually beneficial contract between two or more partners in which resources, knowledge, and capabilities are shared with the aim of increasing the competitive position of each partner. agreements and shared codes on routes (Song et al, 2012). But what explains this behavior in the industry? According to Driskill (2016), several factors contribute to explaining this behavior, particularly over the past eight years:



- Reduction in fuel prices where significant efforts have been made in terms of fuel economy.
- Mergers and acquisitions between airlines.
- New forms of revenue such as additional seats, direct ticket sales, which prevents the payment of commissions to intermediary companies.
- New products such as commissions for the sale of hotel rooms when buying the plane ticket, the sale of food and beverages on flights.
- Sustained growth in the aviation sector which has resulted in increased tourist arrivals, increased number of routes and increased number of aircraft orders.

### 2.1.2. Highlighted in Tunisia

In Tunisia, the tourism sector, as of 2016, ranks second in North Africa according to the arrival of international tourists, a possible explanation is based on a growing transport system, but above all by the geographical comparative advantage of Tunisia represented by the proximity of two major issuing markets, Morocco and the European Union. However, Tunisia has weak air connectivity with Latin America and Asia, and even sub-Saharan Africa in particular.

The increasing opening of borders to economic movements and in particular to tourism is a global trend that has been present for several decades. The bilateral air services agreement between Tunisia and the European Union, which entered into force in 2018, has been a controversial public policy:

- Necessarily supported by the two governments, which, by diversifying the offer to consumers, saw at the macroeconomic level an improvement in trade, particularly in services, between the 2 partners, something that can contribute to the improvement of the Balance of Current Operations<sup>2</sup>, employment and economic growth.
- Rejected or not welcomed by all unions<sup>3</sup> who saw that the Tunisian fleet is unable to compete with those of Europeans and that such an agreement could accelerate the bankruptcy of Tunisian airlines, given that at the end of 2016, the commercial air fleet has 29 planes, against about 1000 for the companies Europeans.

The old regulatory framework governing air transport between Tunisia and the main EU countries required that 2 or 3 designated airlines per country could serve two cities, the capacity to respond to changing market needs being slow, this regulation limiting finally the purchasing options for the consumer.

Information available from the Civil Aviation Office<sup>4</sup> indicates that there are well-connected tourist destinations such as Tunis, Monastir, Sfax and Djerba and others, mainly in the interior of the country such as Tozeur, Tabarka, Gafsa and Gabès require greater connectivity. When there are no direct flights, connections via Tunis Carthage Airport or other connection hubs provide access routes for most passengers.

## 2.2. The bilateral air transport agreement

### 2.2.1. Analysis of legal aspects

The underlying framework for international aircraft regulation is contained in the 1944 International Civil Aircraft Convention, commonly referred to as the Chicago Convention. The framework of operations includes the concept of air freedoms,

---

<sup>2</sup>The improvement in the Current Account Balance will be the result of the improvement in the trade balance, in particular the balance of invisibles (services such as tourism and travel).

The macroeconomic impact of Open Sky will be the subject of Chapter 4.

<sup>3</sup>These are the air transport unions grouped together in the federation of trade unions in the sector, made up of pilots, ground workers and air traffic controllers; they formed a common front to postpone bilateral negotiations with the European Union.

<sup>4</sup>Office annual reports, various issues since 2012.



defined as nine types of operations accepted internationally by the signatory countries of the Chicago Convention of 1944 (Convention d'Aviation Civil international, 1944). Briefly, the nine freedoms can be categorized into three groups:

- Freedoms that do not involve a commercial operation
- Freedoms only involve countries that negotiate
- Freedoms involve countries other than those negotiating

Similarly, under bilateral agreements, the two countries may agree that air freedoms are open, limited or closed depending on the type of aircraft, frequency of flights, authorized cities or destinations and designated airlines. .

International aviation is governed by a series of bilateral treaties between governments which determine the levels of market access for the respective airlines. In legal terms, the new air transport agreement between two governments replaces that approved by the Senate on November 29, 1960, which has been amended seven times: July 1970, September 1988, November 1991, September and December 1997, February 1999 and December 2005. .

The first agreement between Tunisia and the European Union signed on December 11, 2017. The agreement entered into force in 2018. The main points to highlight are:

- The same conditions are established for passenger and cargo flights
- The previous agreement only envisages opening from the 1st to the 5th freedom, i.e. the 6th, 7th, 8th and 9th freedoms are closed
- For the first two freedoms, there are no limitations on aircraft type, flight frequency or destination cities
- For the 3rd, 4th and 5th freedoms, a limit of two designated airlines per country is established for each pair of cities. Three when they are tourist destinations
- The fifth freedom is limited to certain incorporated cities.

The following table shows the new freedom negotiations between the two countries. Shaded cells indicate freedoms that were closed in the previous agreement are now open. For passenger flights, which is the most impactful sector in tourism, the changes are presented in the elimination of the airline designation limit for the 3rd, 4th and 5th freedoms, maintaining these freedoms as existing.

The essence of the agreement is that the airline market for both countries is open, meaning it is no longer limited to a certain number of airlines per route. It is important to mention that, as a result of this agreement, the European Union makes it possible to process requests for alliances between airlines of the two countries. However, it is in cargo flights where greater freedoms are open that Tunisia is an exporting country, the 6th and 7th being open.

**Table 1:** Air transport agreement between Europe and Tunisia

Freedoms	Passengers				Cargo			
	Plane	Flight frequency	Authorized cities	Airlines designated to fly	Plane	Flight frequency	Authorized cities	Airlines designated to fly
1	Open	Open	Open	Open	Open	Open	Open	Open
2	Open	Open	Open	Open	Open	Open	Open	Open
3	Open	Open	Open	Open	Open	Open	Open	Open
4	Open	Open	Open	Open	Open	Open	Open	Open
5	Open	Open	Limit	Open	Open	Open	Open	Open
6	Closed	Closed	Closed	Closed	Open	Open	Open	Open
7	Closed	Closed	Closed	Closed	Open	Open	Open	Open
8	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
9	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed

Source: Our compilation





### 2.2.2. Analysis of economic aspects

This part deals with the economic aspects identified in the countries which have concluded bilateral agreements relating to air services. The international literature analyzes aeronautical deregulation and its impact on competition between airlines. These analyzes can be divided into three main groups (Wang, Bonilla and Banister, 2016):

- The first group discusses the economic rationale for liberalisation,
- the second group focuses on the spatial characterization of deregulation, in particular on the characteristics of airline networks (Dobruszkes, 2009; Goetz and vovles, 2009; Ramos-Pérez and Sanchez-Hernandez, 2014; Cristea, Hillberry and Mattoo, 2015),
- the third group refers to the analysis of the evolution of deregulation from the institutional point of view. According to Wang, Bonilla and Banister (2016), deregulation has had successes and failures. In addition to economic studies on the subject, studies have been carried out on connectivity, the advantages of accessibility and the configuration of networks, from a geographical point of view.

Studies such as Pitfield (2009) and Button (2009) examine the effects of air transport liberalization policies on variables such as economic growth. The volume of traffic, they concluded that the liberalization has contributed to a substantial growth in passenger traffic. Due, among other things, to increased competition and efficiency gains in the aviation sector, as well as positive externalities for the whole economy.

Arguing the benefits of such agreements, Christidis (2016) argues that liberalization allows airlines to optimize their route networks within and outside their national markets. Therefore, traffic flow patterns change. A scenario that has also favored the performance of the sector is that of strategic alliances which have increased following the reduction of restrictions (Yimga, 2017).

One issue worth mentioning is the expansion of the low-cost model of airlines resulting from liberalisation. The rapid growth of low-cost airlines increases competition, stimulates passenger traffic and increases the competitiveness of the domestic aviation industry (Mootien, 2012).

For the particular case of the "open skies" agreement between the European Union and Tunisia, the European Union's Department of Commerce (2007) estimated the economic gains for consumers at 4 billion dollars per year thanks to these agreements. It also estimates a 16% increase in air traffic in the European Union and the support of 9 million jobs in aviation and related industries. Stober (2003) drew similar conclusions claiming that open skies agreements benefit the European aviation sector by creating greater passenger volumes, but more importantly by expanding the network of airlines that improve service and lower fares paid. by consumers.

For the European Union, open skies agreements have enabled cities such as Paris, Rome, Madrid, Hamburg and Munich to significantly increase their international connectivity. Using a quantitative methodology, authors Button, Neiva and Yuan (2014) conclude that transatlantic air transport has increased thanks to the "open skies" agreement. Also using a quantitative methodology, in particular a data panel analysis, Whalen (2007) confirms that airline alliances increase passenger volume.

Most of the reviewed articles that have analyzed the impacts of the open skies policy conclude that the American aviation industry has benefited, but the major European airlines (Transavia, Air Berlin, Easyjet, Norwegian) have complained about unfair competition from Gulf Airlines (Emirates, Etihad and Qatar Airways) which have received privileges from their governments (Oxford Business Group, 2016).

### 2.2.3. Analysis of commercial aviation industries

It was mentioned that the commercial aviation industry has very characteristic aspects that limit the performance of airlines. The following is a brief analysis from the company's perspective. The industry is characterized by information asymmetries where dynamic airline pricing policies prevent consumers from understanding prices.

In general, this is an industry characterized by low profit margins due to unique cost structures and demand shocks. The cost structure depends on each airline and its business model, but on average 30% of the costs are allocated to salaries, 18% to fuel costs, two main concepts.



In recent years, the global commercial aviation industry has recovered mainly due to lower fuel prices and increased demand after the 2009 economic crisis:

- The bargaining power of buyers is high, because leisure customers are extremely price-sensitive, customer loyalty is low, product differentiation is very limited.
- The bargaining power of airline suppliers is high, as there is very little, essentially a duopoly between the Boeing and Airbus companies when large capacity passenger aircraft are involved:
  - The threat of new airline entry is low, as it is a capital and labor intensive industry.
  - Established airlines benefit from alliances and economies of scale.
  - Finally, the threat of substitute transport services is medium for short distances, as users can be transported by car, bus and high-speed train (Dobruszkes, Dehon and Givoni, 2014).

However, when distances are large, the threat of substitution transport is low. The International Air Transport Association (IATA) predicts that the global industry will double its net profits from 2016 due to low fuel costs and growing demand.

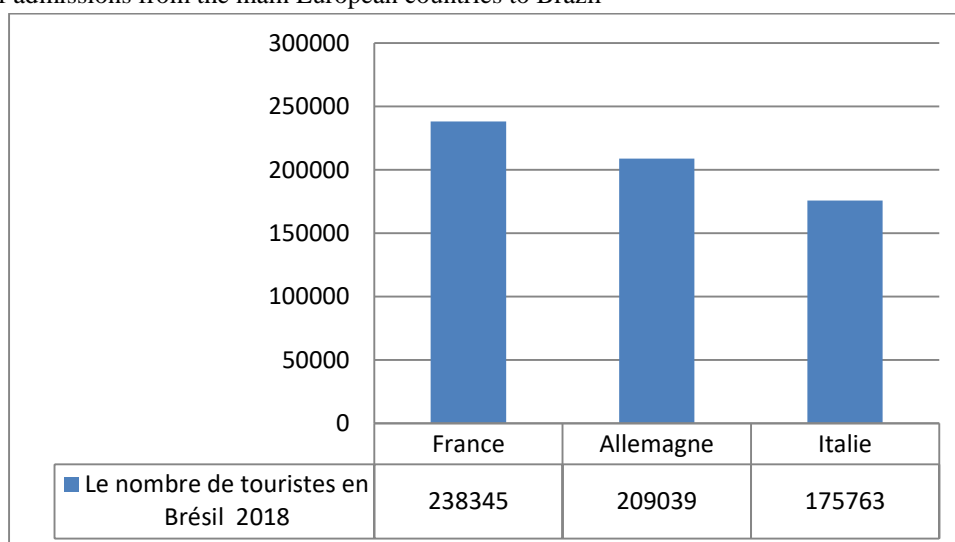
**3. Impact of open sky on airlines**

The approach that we will follow at this level of this article is a purely microeconomic approach; Simultaneously (i) the theoretical model underlying the study of the behavior of airlines under various hypotheses relating to the introduction or not of Open Sky and (ii) the results of the microeconomic analysis will be presented.

**3.1. The Foundations of the Theoretical Model**

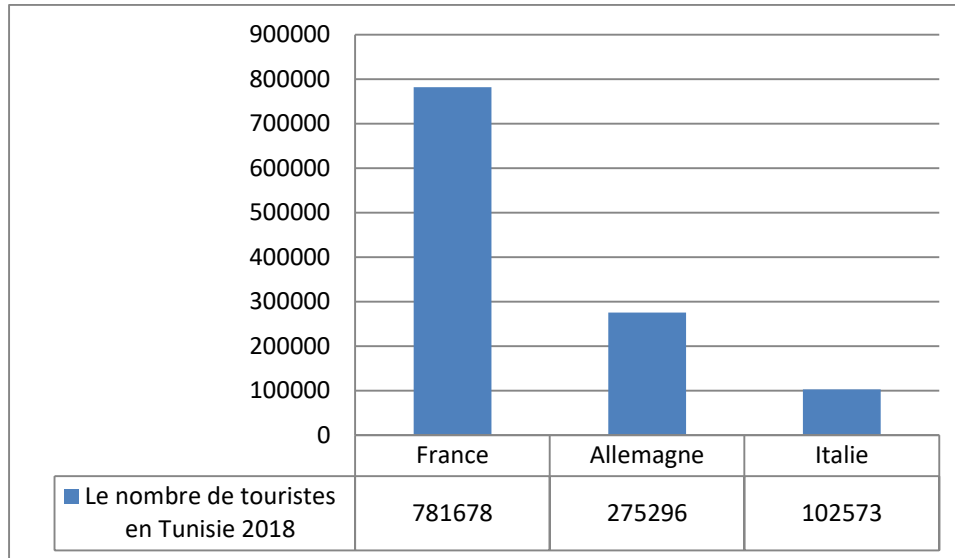
This part presents the theoretical model of Cournot proposed by Alves, Vera and Rosa Forte (2015). The authors analyze the case of an open skies agreement between Brazil and the European Union. This model can be adapted to the case of Tunisia with the European Union since Brazil and Tunisia frequent the same European market for the tourism sector and have the same characteristics in terms of the number of visitors, particularly European. Thus, Brazil received 6,621,375 visitors in 2018, including 1,460,740 European visitors, Tunisia, over the same period received 6,920,188 tourists among them 1,317,029 European visitors

**Figure 2:** Breakdown of admissions from the main European countries to Brazil



Source: World Bank

Figure 3: Breakdown of entries from the main European countries to Tunisia



Source: National Institute of Statistics

3.1.1. Cournot model for the analysis of the effects of the agreement

As mentioned earlier, in the case of Open Sky agreements, more airlines can operate the same destination and route. This part of the thesis attempts to analyze whether the Open Sky agreement, which allows the entry of new airlines, would increase competition, reduce prices and therefore benefit consumers. In this sense, the scenarios are related to the entry of new airlines in certain market segments and the establishment of collusion between two airlines, one of which is the incumbent operator (Tunis air).

The profit of a company depends on the quantity produced and sold. But a company's profit also depends on its competitor's production and sales: The more its competitor sells, the lower the market price will be and the lower its profits will be. There is an interdependence of benefits. Every company knows that if it can unilaterally increase its market share by producing more, its profits will increase.

However, every company also knows that if all companies compete fiercely to increase their market share, they will all be well off. Thus, lower prices will reduce overall and individual profits. The model we will follow is adopted by Alves and Forte (2015), the description of this model is illustrated in appendix 3.1.

The model assumes constant marginal costs for each airline. The inverse demand function (price) of a given airline is defined as the function of traffic or passenger flow satisfied by competitors (Cournot competition). The adopted model represents the international market between the European Union and Tunisia and includes three market segments: Paris-Tunis, Tunis-Djerba and Paris-Djerba.

It is assumed that in this market, only three airlines operate: Air France, Tunisair and Nouvelair. Air France serves the Paris-Tunis segment while Tunisair and Nouvelair are present on the Tunis-Djerba route. Thus, none of the three airlines operates the full Paris-Djerba route. In this scenario, a tourist who would like to travel from Paris to Djerba must buy two tickets, the first transporting him from Paris to Tunis and the second transporting him from Tunis to Djerba. The first segment of the route is a monopoly, the second part is a duopoly. In this initial diagram, three possible scenarios are presented.

In these scenarios, a taxi plane system can be adopted between the Djerba-Zarzis and Tunis-Carthage airports which are at a distance of 500 kilometers from each other. To make the transfer, a traveler can opt for a yellow taxi or he can book a private shuttle in advance. The price difference between a yellow taxi and a private transfer is negligible. On the other hand, if there are





many travelers, booking a transfer (by minivan or by train) is less expensive because the yellow taxis only take three people. By booking online, you can save time and you will be quiet.

### 3.1.2. Expected effects of the agreement

The analysis of the effect of the conclusion of an "Open Sky" agreement between Tunisia and the European Union will be carried out according to 3 scenarios:

- Scenario 1: Air France enters the Paris-Djerba and Tunis-Djerba circuit
- Scenario 2: Competition on the Paris-Tunis and Tunis-Djerba Market
- Scenario 3: Collision between companies

#### 3.1.2.1. Analysis under scenario 1: Air France enters the Paris-Djerba and Tunis-Djerba circuit

In this first scenario, Air France enters the Paris-Djerba circuit, which allows it to be present in the three market segments (Paris-Tunis, Paris-Djerba and Tunis-Djerba), thus increasing competition in the segment Tunis-Djerba.

By comparing the results of the initial situation and the results presented in this first scenario, the model suggests that prices on the Paris-Djerba and Tunis-Djerba routes should decrease. The effect on the Paris-Tunis segment is unclear, as it depends on several factors. Since the Paris-Tunis route does not have many substitutes, the price is expected to increase, as the Open Sky agreement does not introduce additional competition, there is no pressure to reduce the price. Again, the Paris-Djerba segment should be cheaper as it is offered by several airlines from Europe.

This result is consistent with the conclusions of Cournot (1838), namely that in the case of two complementary products (routes Paris-Tunis and Tunis-Djerba) produced by a single company, prices will be lower; So it benefits the consumers of the whole journey.

Similarly, the European companies will realize greater profits than the sum of the Tunisair and Nouvelair profits with regard to the Tunis-Djerba route; the same companies will realize greater quality benefits as a result of the Open Sky agreement. Tunisair and Nouvelair will benefit from lower profits under the Open Sky agreement.

Passengers benefit from the open sky provision for the Paris-Djerba and Tunis-Djerba route segments. Given the effects on tourism, this would necessarily increase the number of tourists traveling to Djerba, due to lower prices. On the other hand, passengers on the Paris-Tunis line will experience higher prices because the route remains monopolistic.

#### 3.1.2.2. Analysis under scenario 2: Competition on the Tunis-Djerba and Paris-Tunis market

In this second scenario, Air-France enters the Tunis-Djerba market and Tunisair enters the Paris-Tunis market. As a result, competition in the Paris-Tunis market is increased compared to the first scenario, since the Paris-Tunis route is operated by two companies, while Nouvelair only operates the Tunis-Djerba route.

Comparing the expected results of the initial situation, in the second scenario of open sky, the prices in the three segments (Paris-Tunis, Tunis-Djerba and Paris-Djerba) would decrease, increasing the number of passengers and benefiting the passengers on all markets.

As far as airline profits are concerned, the effects of liberalization are not uniform. While Tunisair's results increase in this second scenario, Nouvelair is damaged by deregulation, which reduces its profits, as the Tunis-Djerba segment shrinks. Air-France's entry into the Tunis-Djerba segment increases competition.

#### 3.1.2.3. Analysis under hypothesis 3: Collusion between Air France and Tunis air

In the third scenario, Air France and Tunis air agree to operate Paris-Tunis flights by offering passengers Paris-Tunis and Tunis-Djerba routes as part of the collusion system. By comparing the results of the initial situation with this third scenario, the price of Paris-Djerba decreases again and generates a greater flow of passengers.

The price in the Tunis-Djerba segment remains the same, as does the number of passengers. By analyzing the profits of the airlines, it can be concluded that after the Open Sky agreement, the profits of Air France and Tunisair would increase. This increase



is expected since the objective of collusion is the joint maximization of the profits of the two companies. Finally, traffic in the Paris-Tunis segment should increase or decrease as in the first scenario.

Comparing the expected results of the three scenarios, it is observed that the second scenario is the one that benefits passengers the most due to lower prices in the three segments of the flight and is the one that would generate a greater flow of passengers and tourists. However, this second scenario is also the one that generates the most incentives for airline collusion, because it is the third scenario that generates more profits for the airlines. The above results are summarized in the following table.

**Table 2:** Summary of expected results of the theoretical model

	Segment 1. CDG-TUN	Segment 2. TUN-DJE	Segment 3. CDG-DJE	Results of open pit against the initial situation
Initial situation without open sky	An option : Air France (monopoly)	Two options: Tunis air Where Newair (duopoly)	None Airline company	
<b>First scenario</b> Because of Open Sky, Air France enters the full Paris- Djerba route.	An option : Air France (monopoly)	Three options: Tunis-Djerba Paris-Tunis Paris - Djerba	An option : Air France	The price decreases in segments 2 and 3, more passengers due to increased competition. Air-France gets more profits. Tunis Air and Nouvelair get less profit.
<b>Second scenario</b> Due to the open skies, Air France enters the Tunis - Djerba route and Tunis air enters the Paris-Tunis route.	Two options: Air France, Air Tunis (duopoly)	Three options: Tunis Air, Newair, Air France	An option : Air France	More competition on the Paris-Tunis route. Lower prices in all three segments, so there will be more passengers. Tunisair gets more profits. Due to deregulation, Nouvelair will make less profit. The profits of Air-France will depend on the level of efficiency of the company. This is the most advantageous scenario for passengers and the one that attracts the most tourists to Tunis. But it is also the one that generates the most incentives for airlines to collusion.
<b>Third scenario:</b> Air-France and Tunisair have agreed on quantities to operate the route Paris-Tunis.	Two options: Air France, Tunisair (duopoly)	Three options: Tunisair, Newair, Air France.	Two options: Tunisair, Air France	More competition on the Paris-Djerba route. Lower prices in all three segments, so there will be more passengers. Air France and Tunisair get more profits. Nouvelair less profit.

Source: Author's summary



Airlines that lack the ability to compete will be negatively affected, their profits will decline, a claim that contradicts the expected effects in the literature. Part of this assertion is explained by the strategic behavior adopted by airlines, the restructuring of routes and networks, loyalty programs as well as the limited capacity of airports which can delimit the positive effects expected by governments when concluding of this kind of Open Sky agreements.

## CONCLUSION

We conclude that after the implementation of an “open skies” agreement, prices have fallen on international routes where competition is increasing, which will therefore benefit consumers. This drop in prices and the increase in consumer surplus are in line with those expected by the literature and are also due to the effect of double marginalization.

- In hypothesis H1 (enterprise 1 entering the Tunis-Djerba market), consumers benefit because of the drop in prices on the Tunis-Djerba and Paris-Djerba segments. However, in the Paris-Tunis segment, prices may increase because this market segment remains a monopoly of company 1.
- Under hypothesis H2 (entry of company 1 on the Tunis-Djerba market and entry of company 2 on the Paris-Tunis market, As expected, an "open skies" agreement will lead to a drop in prices on all markets, which will benefit consumers on all routes.
- In hypothesis H3 (collusion between companies 1 and 2), the liberalization of an international market tends to benefit consumers on the Paris-Djerba international route due to the fall in ticket prices on this market.

## REFERENCES

1. Alex Cosmas, Peter Belobaba, William Swelbar, 2010, The effects of open skies agreements on transatlantic air service levels, *Journal of Air Transport Management*, V16, pp 222-225.
2. Alejandro Micco and Tomás Serebrisky, 2006, Competition regimes and air transport costs: The effects of open skies agreements, *Journal of International Economics*, V70, pp25-51.
3. Button, Kenneth, Rui Neiva, and Junyang Yuan. "Economic development and the impact of the EU–US Trans-atlantic Open Skies Air Transport Agreement." *Applied Economics Letters* 21.11 (2014): 767-770.
4. Button, Kenneth. "The impact of US–EU “Open Skies” agreement on airline market structures and airline networks." *Journal of Air Transport Management* 15.2 (2009): 59-71.
5. (Dobruszkes, 2009; Goetz and vowles, 2009; Ramos-Pérez and Sanchez-Hernandez, 2014; Cristea, Hillberry and Mattoo, 2015
6. Bonilla and Banister (2016)
7. Barbot, Cristina. "Economic effects of re-allocating airports slots: a vertical differentiation approach." *Journal of Air Transport Management* 10.5 (2004): 333-343.
8. Barbot, Cristina. *Lowcost carriers, secondary airports and State aid: an economic assessment of the Charleroi affair.* Faculdade de Economia, University of Porto, 2004.
9. Barro, Robert J. and Sala-i-Martin, Xavier, *Economic Growth*, McGraw-Hill, Inc. USA, (1995)
10. Caliendo, Marco, and Sabine Kopeinig. "Some practical guidance for the implementation of propensity score matching." *Journal of economic surveys* 22.1 (2008): 31-72.
11. Caupin, Vincent, and Tahsin Saadi Sedik "open trade policy and instability of economic growth." (2003).
12. Caupin, Vincent, and Tahsin SAADI SEDIK. *Trade openness policy and instability of economic growth: The case of Middle Eastern and North African countries.* No. 200330. 2003.

---

*Cite this Article: GHAZOUANI Nidham (2022). The Impact of Open Sky on Airlines Theoretical Study: Case of Tunisia. International Journal of Current Science Research and Review, 5(9), 3765-3775*