Tourism and air traffic statistics: the case of the Palermo region

Carlo Amenta, Anna Maria Milito

Department of Quantitative Methods for Human Sciences
University of Palermo
Viale delle Scienze
90128 Palermo

Abstract

For a city that hosts a considerable number of tourists every year, an understanding of how this flow of visitors is to reach the city and how the transportation system functions is of vital importance.

We focussed our attention on Palermo “Falcone-Borsellino” airport because of the natural characteristics of Sicily and the existing infrastructures. Air transport plays a fundamental role for an island that is difficult to reach by either car or train. Using the data collected by the airport for institutional purposes, we have studied the movements of both incoming and outgoing passengers from and to other European countries, with particular attention to charter traffic because of its link with the tourist sector. We have also taken into account certain aspects of the charter market, highlighting the variability that characterizes this sector.

In this paper we have also underlined the difficulties and problems linked to the collecting and managing of air traffic statistics and suggest that further research applications be applied to this area of data collection. This is to be considered as a preliminary step in applying these statistics to an airport that serves a region of the dimension of Palermo.

1. Tourism in Sicily

With more than 3.5 million arrivals in the year 2000, Sicily is one of the most active tourist regions in Italy. During 2000, the rate of growth in the sector was 9.7% and the number of days that tourists spent in the region increased by 12.1% compared to 1999. More specifically, the Palermo region claims 28.54% of the total arrivals, corresponding to 26.61% of the total tourist presence in Sicily. Together with Messina, it heads the Regional lists as a market performer [Regione Sicilia, Primo Rapporto sul Turismo in Sicilia (PRTS), 2001].

Tourism represents an important economic opportunity for Sicily. With a very high rate of unemployment and very poor performance in the industrial sector, it is one of the worst-performing economies in Italy. “The tourist industry is linked to a large number of business activities (airlines, shipping companies, railways, coach and tour operators, hoteliers, food and catering establishments, providers of entertainment and souvenir
retailers)” [Tak-Kee Hui and Chi Ching Yuen, 2002], a statement which provides reasonable grounds for affirming that tourism could become one of the driving forces behind economic growth in Sicily.

Tourism’s full potential could be realized, were it not for a series of chronic problems, including the shortage of adequate, modern infrastructures and the limited resources of hotels and resorts.

In a survey on tourism in Italy, conducted by the IS.NA.R.T. (Istituto Nazionale di Ricerche Turistiche) in 1998, of the tourist destinations preferred by foreign tour operators, Sicily ranked 5th. In the light of the above considerations, we can safely say that Sicily attracts less tourist flows compared to its effective potential. This concerns the flow of foreign tourists in particular [Regione Sicilia, PRTS, 2001]. The main causes for this are:

a) the infrastructure problem, with regard to both transportation and the communication system
b) the inadequacy of the Island’s hosting system.

2. Tourism and the transportation system

We can say that: “Transportation and Tourism are business activities that share the same motivation: to satisfy the need to explore the environment and to provide the necessary mobility to do so” [Del Viscovo, 1994]. A tourist is a traveller and as such needs to make optimum use of the transportation system. Only in this way can a trip be a success. A delayed flight or an uncomfortable trip on a noisy train can spoil the tourist’s experience irreparably. If a destination can be reached quickly and easily, employing a variety of means of transportation, it has an advantage over its competitors and can be classified as a winning product.

For the successful development of the tourist sector in a particular area, it is extremely important that the area be “accessible”. Accessibility, in terms of the transport system, can be defined as: “…the area of influence of a terminal on a territory. A terminal can be considered as the facility from which the transportation network can be accessed or exited.” [Del Viscovo, 1994].

Tourism without an efficient transport system is a contradiction in terms, especially for an island like Sicily, where it represents a factor of primary importance. The choice of the most efficient means of transport is fundamental for the traveller and the tourist’s

---

1 ISTAT website, [www.istat.it](http://www.istat.it), provisory figures for the year 2000 and first trimester of 2001
motivation in coming to your region has to be better understood if a competitive system is to be developed [Baldassarri, 1994].

In 1999, the Sicilian regional government drafted a Regional Development Transportation Plan, with the aim of improving the quality and efficiency of the island’s transport system. The objectives of the plan are:

a) the reorganization of the local transport system to improve tourist mobility within the region;

b) the improvement of airport infrastructures and the upkeep of those minor airports that are of fundamental importance for both tourist traffic and indigenous social purposes; the building of an airport to serve the Aeolian islands and the reshaping of tariff policies;

c) the improvement of sea-linkages and the improvement of the harbour system and the creation of yachting harbours;

d) the creation of a stable infrastructure linking the island to the rest of the country (the building of a bridge between Messina and Reggio Calabria) and the development of port facilities for that purpose;

e) improvement of the railway system;

f) the completion of the road system;

g) the creation of infrastructures for walkers, bicycle and wheelchairs users with the realization of a clearly-mapped transportation system; [Regione Sicilia, PRTS, 2001].

In this paper, particular attention has been focussed on air transport facilities, both on account of the natural features of the island and for the importance they play in the development of the tourist sector in general.

3. The air transportation system

The world has grown smaller and people travel more. The airplane is this century’s most important vehicle of transport and the development of the airline business is fundamental to the growth of tourism. The liberalization of the airline market that began in the 1970s continues, and nowadays almost every part of the world can be reached by plane.

Understanding the dynamics of the airlines and airport business can provide a key to understanding and forecasting the development of several other business sectors and, as previously mentioned, that of the tourist sector in particular.
The role played by air-chartering in the creation and development of tourist package holidays is of fundamental importance. Since the 1950s, the growth of this kind of tourism has played a vitally-important role as a driving factor behind the tourist sector in general. Today, the inclusive charter tour is one of the most widely-used tourist products and can be considered the best example of mass production in the sector. The concept of a product in tourist marketing is often associated with the all-in tour, and nowadays tourists who organize their own trips have become very rare. The advent of Internet has tended to modify this trend. It is easier to organize your trip by contacting a hotel and buying an air ticket over the web. In any case, even if the number of internet users is rising the “traditional” way of travelling is still the most widespread.

When we began to work to this paper, we attempted to better understand the role of air transport statistics research applications, as we are convinced that only by analyzing data with the correct methodologies can you achieve adequate knowledge of related problems and assist those who have to face them in finding optimum solutions.

We found very few academic references to this field of statistics. Several authors concentrated on airline statistics, more specifically so in an attempt to examine problems of market concentration or market liberalization issues. [Hergott, 1997; Dempsey, 2001]. Others authors attempted to investigate and solve problems concerning the optimization of scarce resources for the airlines and airport business as like as limited numbers of slots, timing problem and infrastructure capacity. [Butler and Houston, 1999; Jarrah and Strehler, 1999].

The situation improves if we look at the literature on tourism concerned with problems of air transport statistics. There is extensive research in which air traffic statistics applied to analyses of tourism are employed. Time series are often used to analyze current situations and to establish forecasts that highlight the strengths or weaknesses of a country either in attracting tourists or in understanding demand [Jorgensen and Solvoll, 1996; Gillmor, 1996; Tak-Kee Hui and Chi Ching Yuen, 2002; Pearce, 1987].

Monthly or annual air statistics reports, issued by both national and regional organizations or government departments, are available. These reports provide a set of performance indicators and statistics that are used as international standards to evaluate airport efficiency, airplane safety, policy analysis, cost and productivity analysis or environmental issues. “Airlines, airport authorities and suppliers of aircraft and other material inputs require quantitative information to make effective management decisions and to permit longer term planning” [Button, 1999]
Quantitative information is extremely important for this sector. In regions where economic regulation still applies, it plays an important role in the evaluation of the efficiency and convenience of air traffic liberalization agreements and, in this case, statistics can be used for both private and government sector use. The sources of these statistics are varied and there are a number of primary and secondary sources available [Button, 1999].

4. The case of the Palermo region

We are convinced that the development of Sicily and in particular of the Palermo region is linked to the development of tourism. The accessibility of the area is fundamental for that development, and the airplane is the most important means of transportation for the region. The airports in Sicily are:

1) Palermo: “Falcone and Borsellino”, the larger for capacity and number of runways;
2) Catania: “Fontanarossa”, which has reached its operational limit;
3) Trapani: “Birgi”, which is oversized if compared to its activity;
4) Pantelleria: a small airport with local traffic;
5) Lampedusa: the traffic grows considerably during the summer on account of tourist arrivals;

With 43,494 aircraft movements and more than 3 million passengers in the year 2001, the “Falcone and Borsellino” airport is the most important transport infrastructure in Sicily and its efficiency is of fundamental importance for the economic growth of the region.

The airport is run by the Gesap, which is responsible for administrating, operating, managing and coordinating the various airport infrastructures. Since December 2001, the Gesap has been entrusted with the total management of the airport and is now responsible for managing the runways, the connections between these and all airport security matters. The company also has responsibility for all handling processes. Indeed, the Gesap is, to all effects, fully in charge of the airport management. The company’s responsibility extends to collecting statistics relevant to a series of issues, which include: security control, service quality and handling revenue.

However, these statistics can also be useful in analysing passenger flows, in understanding traffic trends and growth rate and, also, for a better grasp of the problem areas or opportunities with which the Gesap is likely to be faced in the near future.

We chose to focus on the Palermo airport-management company as we feel that a preliminary analysis of airport statistics (arrivals, departures, origins and destinations of
those who travel to and from Palermo) can be useful to an understanding of whether and how these statistics can be used as an indirect measure of potential economic growth for the region. We were further encouraged to undertake this research by the willingness of the Gesap management to cooperate with us in investigating several of aspects of their business. The link between business and academia has proved of fundamental importance for the economy and could play a vital role in Sicilian development today.

Our paper has also taken the statistics referring to the origins of charter traffic in Palermo into account. As previously mentioned, charter activity is closely linked to the tourist sector (see Gillmor) and it is safe to say that almost all those travelling to Sicily by charter do so for tourism. Charter activity is an answer to the tourist’s need to reach their holiday destination quickly and cheaply.

This assumption about the link between tourism and charter activity is based on established figures, (see also Gillmor and Jorgensen for a better knowledge and understanding of this link) and for this reason we have focussed our analysis on the statistics regarding charter activity at Palermo airport. We have attempted to establish a dataset about charters that can be useful for further research activities.

5. Data Analysis

It has proved impossible to establish an adequate time series to analyse trends in this flow of traffic, as in 1998 the Gesap up-dated its data processing system and the presently-installed system has proved incompatible with the previous version. For some variables we have data from 1995 to 2001. In other cases we had to analyse data for the period from 1999 to 2001. However, it appears the problem with the time series is not unfamiliar in the collection of air transport statistics [see Button].

We shall start with a general look at air traffic in Palermo airport, considering trends in the previously-mentioned period. This can be considered both as a good measure of airport growth rate and an indication of any problems the airport management company is likely to encounter if the airport infrastructures are not improved.

The figure below shows the number of incoming and outgoing passengers for both regular and charter flights operating at Palermo airport for the period 1995-2001.
Regular growth was observed until the year 2000. In 2001, passenger numbers decreased slightly. This is most likely linked to the notorious event of September 2001 that dramatically changed the air traffic market scenario. However, we feel it is reasonable to claim that traffic will start to grow in the immediate future. In view of this forecasted increase, Gesap has approved an airport infrastructure development plan that is to restructure the arrival zone and build a new loading bridge for out-going passengers from Palermo. This plan aims at providing a series of improvements to the airport infrastructures such as to allow it to handle a considerably higher volume of air traffic. A more in depth analysis of this data, as well as figures for charter traffic, are provided below.

The following map shows the geographic distribution of incoming flows by charter from the rest of Europe to Palermo airport (98% of the total air charter traffic at Palermo airport is from European countries). The rhombus represents average arrivals for the period 1995 – 2001 and the size of the symbols are graded by square root to provide a better overall view.
Figure 2 – Geographical distribution of charter arrivals to Palermo airport in the period 1995-2001

As we can see, France is the country from which comes the highest number of tourists. The average of 81,800 passengers arriving in Palermo by charter is genuinely impressive if compared to the figures for charters from both the United Kingdom and Germany (14,863 and 13,609), which are third and fourth after Italy in this classification.

In figure no. 3, we find the comparison between the years 1995 and 2001 for arrivals from a number of European countries. The figure highlights the considerable decrease for the countries with the highest number of in-coming passengers (France, United Kingdom and Germany). This is of particular interest, considering that these are all countries from which a considerable flow of tourists used to arrive in the past. On the contrary, for the other countries a remarkable increase is registered - especially for Eastern European countries (Hungary, Czech Republic, and Poland). These are all countries that, over the last few years, have improved their economic situation and are gradually becoming a source of out-going tourist flows. This is of particular interest in delineating public policy concerning tourism. It may well prove a strategic move to develop specific regional policies that focus increased attention on the tourists who come from these countries.
Probably analysing the number of arrivals and departures (number of passengers), without having a more accurate knowledge of passenger nationality, is likely to provide inadequate information. Can we consider all those who come to Palermo as arrivals, or do these include a high percentage of the town’s citizens returning from holiday?

The comparison with departures between 1995 and 2001 confirms the trend observed for arrivals. The Sicilian tourist’s motivation and choice of destination could be a good reason for the change in traffic trends. Perhaps Paris has been replaced by Prague as a preferred destination for our holidays. We have to be careful in our analysis without more specific information.

Greater accuracy could be provided by examining the trend regarding the overall number of arrivals and departures for each European country. The countries with a higher rate of growth could provide a good target for specific tourist promotion.

The comparison between the year 1995 and the year 2001 for global traffic for each country shown in the figure below confirms what we wrote above and strengthens our assumption regarding trends for Eastern European countries.
Then we analysed the geographical distribution of arrivals from specific cities (considering that the trend for them is very similar to that for departures and total traffic) for the years 1999, 2000 and 2001 in every country that has average arrival figures in excess of 10,000 passenger (France, U.K. and Germany). This information is fundamental in the planning and development of tourist marketing strategies by the municipal or regional authorities. Knowing the exact origins of tourist demand allows for better organization and an improved communication plan. Also, places from which a high number of tourists do not visit the Island can be targeted for a specific marketing campaign. As we have already mentioned, a more in-depth analysis is needed, considering that especially for the bigger cities and capitals, the number of arrivals has to be compared to the number of passengers reaching these destinations from Palermo. Knowing time schedules and passenger lists can help distinguish between passengers coming to Palermo for tourism and the number of Palermitans who travel abroad.

In the figures below we represent the geographical distribution of arrivals from France; the voice “other cities” includes cities from which under a 1,000 tourists leave every year.
While, with regard to France, we have a very variable reality, more particularly with regard to the capital, the situation is quite different for the United Kingdom. All the air traffic to and from the UK comes from London and there is no traffic from other cities. The reasons for this could be manifold, but the fact itself is noteworthy.

For Germany (see figures n. 8, 9 and 10) the role of Francoforte and Dusseldorf as traffic-generating cities as compared to Berlin is of particular interest. The capital is not a
leader in generating traffic as Paris in France or London in the United Kingdom appears to be.

Figure 8 – Passengers incoming from Germany: year 1999

Figure 9 – Passengers incoming from Germany: year 2000

Figure 10 – Passengers incoming from Germany: year 2001
We considered it worthwhile to include the market situation of the charter companies in our analyses. For every year from 1999 to 2001 we considered the companies with more than 10,000 passengers per year to show which of them are market leaders in Palermo airport charter traffic. The liberalization of air transport saw the arrival on the market of a high number of companies. An indicator of this situation is that the voice “other companies”\(^2\), which includes companies with less than 10,000 passengers per year represents a high percentage of the total. The market situation is somewhat fragmented and we can say that the real market leader is Star Europe, which constantly attracts a high number of passengers (see the following figures).

![Figure 11: Number of passengers for charter companies: year 1999](image1)

![Figure 12: Number of passengers for charter companies: year 2000](image2)

\(^2\) The other companies represent about the 74\% of the total number of companies for all the period considered.
As we can see from the table below that, in the charter market “booms” and “busts” are frequent and the companies with a stable flow of traffic are very few.

**Table 1 – Number of passengers for charter companies in the period 1999-2001 and annual variation**

<table>
<thead>
<tr>
<th>COMPANIES</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>Variation 99/00</th>
<th>Variation 00/01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeris</td>
<td>3.257</td>
<td>32.041</td>
<td>29.987</td>
<td>883.76%</td>
<td>-6.41%</td>
</tr>
<tr>
<td>Air Tolouse</td>
<td>32.663</td>
<td>0</td>
<td>0</td>
<td>-100.00%</td>
<td>-</td>
</tr>
<tr>
<td>Airtours Int.</td>
<td>29.806</td>
<td>47.980</td>
<td>0</td>
<td>60.97%</td>
<td>-100.00%</td>
</tr>
<tr>
<td>Alitalia</td>
<td>13.087</td>
<td>10.697</td>
<td>51</td>
<td>-18.26%</td>
<td>-99.52%</td>
</tr>
<tr>
<td>Azzurra Air</td>
<td>0</td>
<td>0</td>
<td>12.096</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Blu Panorama</td>
<td>2.162</td>
<td>5.621</td>
<td>29.742</td>
<td>159.99%</td>
<td>429.12%</td>
</tr>
<tr>
<td>British Midland</td>
<td>22.841</td>
<td>7.093</td>
<td>12.559</td>
<td>-68.95%</td>
<td>77.06%</td>
</tr>
<tr>
<td>Cross Air. Int.</td>
<td>14.161</td>
<td>13.014</td>
<td>15.568</td>
<td>-8.10%</td>
<td>19.63%</td>
</tr>
<tr>
<td>Cross Air</td>
<td>12.605</td>
<td>11.535</td>
<td>11.267</td>
<td>-8.49%</td>
<td>-2.32%</td>
</tr>
<tr>
<td>Euralair Int.</td>
<td>24.250</td>
<td>12.965</td>
<td>25.104</td>
<td>-46.54%</td>
<td>93.63%</td>
</tr>
<tr>
<td>Eurofly</td>
<td>3.637</td>
<td>33.018</td>
<td>1.865</td>
<td>807.84%</td>
<td>-94.35%</td>
</tr>
<tr>
<td>Sobelair</td>
<td>10.678</td>
<td>10.270</td>
<td>14.952</td>
<td>-3.82%</td>
<td>45.59%</td>
</tr>
<tr>
<td>Star Europe</td>
<td>57.418</td>
<td>58.973</td>
<td>49.924</td>
<td>2.71%</td>
<td>-15.34%</td>
</tr>
<tr>
<td>Sterling Europ.</td>
<td>12.648</td>
<td>8.863</td>
<td>0</td>
<td>-29.93%</td>
<td>-100.00%</td>
</tr>
<tr>
<td>Volare airlines</td>
<td>34.483</td>
<td>6.828</td>
<td>33.319</td>
<td>-80.20%</td>
<td>387.98%</td>
</tr>
</tbody>
</table>

An analysis of the number of passenger transferred for the years 1999, 2000 and 2001 by each company shows high variability, with some companies operating only in some periods and others with irregular passenger volume in term of time and consistency (some of them operate for one year only while others organize only one or two flights).

The table provides information on the companies that provide transport for in excess of 20,000 passengers for at least one of the years examined. Between these companies we...
chose those with the most regular traffic to analyse the monthly time series that, as can be seen from the figure below, highlights a number of cyclic features.

As can be seen from the figure the traffic is really high in the period that goes from April to September, even if there is an irregular trend for each company in each of the years taken into account.

![Figure 14 – Monthly time series for the period 1999-2001: leader companies in charter market](image)

6. Conclusions

Airport statistics can be used for a number of purposes. We have attempted to establish statistics using the data collected by the Palermo airport management company for institutional purposes.

As already mentioned, in this article we have attempted a first descriptive analysis of data concerning regular and charter traffic for Palermo airport, focussing our attention on charter flights, with the intention, however, of conducting further in-depth investigation into other aspects of airport reality: those relating to the economy and concerning revenue to the airport management company from traffic (taxes and handling tariffs, delays (causes and impacts) and general performance indicators for the airports.

Working with air traffic statistics is not easy. Comparisons with dataset collected for other countries can be a real problem because of the different criteria employed in data collection. With a more adequate time series, correlation between specific events and trends in air traffic can be indicated and a forecasting model for tourist demand for the city of Palermo established.
Charter package holidays are the most widely used tourist product nowadays and a good knowledge of destination and arrival flows, of the market in general and of airport management efficiency can be a key for success in this sector. Air statistics are important to gain a lot of information to improve the tourist offer and to help tourist growth.

Acknowledgments

The authors would like to thank the GESAP S.p.A. for having provided the data presented in this paper.

References

Baldassari G., 1994 – Alcune considerazioni su trasporti e turismo, Rivista Italiana di Economia, Demografia e Statistica, n.1-2, SIEDS, Roma;


Del Viscovo M., 1994 - Trasporti e turismo, Rivista italiana di Economia, Demografia e Statistica, n.1-2, SIEDS, Roma;

Dempsey P. S., 2001 – Airport Landing Slots: Barriers to Entry and Impediments to Competition, Air & Space Law, vol. XXVI, n.1;


Jarrah A. I. and Strehler J.C., 2000 – An optimization model for assigning through flights, IIE Transactions, 32;


Pearce D. G., 1987 – Mediterranean charters – a comparative geographic perspective, Tourism Management, December;

Regionale Siciliana – Assessorato del turismo, delle comunicazioni e dei trasporti, 2001 – Primo rapporto sul turismo in Sicilia, Mercury s.r.l.;

Tak-Kee Uui and Chi Ching Yuen, 2002 – A study in the seasonal variation of Japanese tourist arrivals in Singapore, Tourism Management, 23;