7 CHAPTER SEVEN: CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

The purpose for this study was to develop a model that would be able to estimate the cost of an airline service along a given route, given aircraft technical specifications and data relevant for different components of the cost structure. This information was then to be applied to the African region as a tool to design an economically efficient service along each route, within the continent.

7.1.1 Operating cost structure

The operating costs of airlines are divided into operating and non-operating items, to distinguish the latter as the costs and revenues not directly associated with airlines' own air services i.e. revenues from investments like shares, real estate, profits from affiliated companies, interest from loans, etc.

The operating items are then further divided into direct and indirect operating costs, where the former include all costs that are dependant on the type of aircraft being operated. The latter include all those costs that have to be incurred regardless of the type of aircraft; examples include general administration, marketing, sales and commission, etc.

For this study, the operating items, were considered and sub divided under the following headings: Standing Costs-, which included all costs that are incurred on the aircraft. These costs are as a result of acquiring the aircraft and are not dependent on whether the aircraft is being utilised or not. They include: depreciation, insurance and interest costs. The equations compiled for these components of costs were all calculated per hour utilised, implying that the more the aircraft is utilised, the faster these costs are paid off.

Flying costs include the costs that are incurred during the aircraft's flight time; they include fuel, crew costs and maintenance. These cost components are the running costs of the aircraft during flight time.

Other costs which costs include all other expenses incurred while running the airline service i.e. commission, passenger handling, while some stay constant and are incurred regardless of the passenger demand i.e. landing fees, parking fees, and general administrative costs.

7.1.2 Model structure

The model structure followed a systematic procedure combining the costs that are incurred for any given route, per hour utilised. This then enabled the output of this model to give different costs per aircraft type for the same trip. Using the route characteristics and the operating costs calculated, the output sheet then compiles a cost analysis for the service being provided including: cost per aircraft-km, cost per passenger at full capacity and existing passenger demand, costs per available seat-km, cost per hour utilised and utilisation coefficient. The model calculates the operating costs, from which the most economic aircraft type can be chosen to serve a route at a suitable design frequency and fleet size. Service performance and efficiency indicators calculated are also used as a measure for the aircraft type chosen, the higher the value the better the service.

7.1.3 Route cost analysis

All these component of the costs structure are analysed to assess the impact on the operating costs. The major determinants were found to include fuel, crew costs, frequency of flights (utilisation) and passenger demand. This implied that, the model had to have a variety of aircraft with different seat sizes to balance the load factors the point at which profits can be attained, with reasonable frequency of flights, whilst keeping operating costs at a minimum. On the other hand, aircraft types with varying technical characteristics like maximum range; maximum fuel capacity also had an effect of lowering operating costs.

Generally, smaller aircraft were found to have lower operating costs than larger aircraft making them cheaper to run even when passenger demand is reasonably high, since their costs incurred even for higher frequency of flights is still much less than flying 400-seater aircraft at lower flight frequency. This is the basic principle used by low-cost air carriers flying low capacity planes over short distances at high frequencies.

7.1.4 Route service operations

The model was applied to varying distances and passenger demand, to design an optimum service. For each distance, per aircraft type the maximum and minimum trips to meet demand were calculated and the appropriate fleet size chosen.

The biggest factors affecting fleet size are the number of hours utilised from the sector distance and frequency of flights, since the shorter the distance, the larger the aircraft trips one aircraft can make. In situations where the trips are longer, each aircraft has a maximum number of trips it can make, this implies that the fleet size has to increase if the demand is not met. Economies of scale on routes are achieved by monitoring the load factors and where possible extra utilisation of aircraft by leasing.

The hyperbolic relationship between costs per passenger and increasing passenger numbers was confirmed by the model, proving the theory that for long haul routes especially, the greater the passenger numbers, the lower the costs since the operating costs for this route are spread over more passengers. This explains why for busy routes in the aviation industry, airlines can charge low airfares, using larger more expensive aircraft, because costs are spread over more people.

7.1.5 Africa Application

Databases for Africa input data for route length and passenger data were created in two 50 X 50 matrices. By automatically linking these matrices to the model, all routes within Africa, will be analysed.

In order to summarise whether the problems have been addressed by this study, the model was applied to the route Entebbe, Uganda and Johannesburg, South Africa that has 599 weekly passengers with a route length of 2 942km, and analysis of the route done. Suggestions about further research on the cost-effectiveness of moving limited passenger demand from their origin to destination by hubbing to consolidate passenger traffic, was done.

In conclusion, the cost model, developed can be used to address issues concerning analysis of air services along routes within Africa as has been shown above. Because of the number of assumptions in the model, the results are useful in relative terms, but not necessarily in absolute terms

7.2 Recommendations

Based on the findings of this study, it is recommended that:

1. Based on the model, a sensitivity analysis should be carried out to determine the relative importance of the input data. This will define the date for which accurate and up-to-date information must be collected for successful application
2. More up-to-date cost component equations and default values should be drawn up in the aviation industry. Most of the equipment, economic market prices and technology used to cost airline services has changed over the last two decades and therefore newer more generalized equations or default data need to be developed, for this ever changing field.
3. Civil aviation authorities, airlines, and airport companies, create, compile and update databases for the air passenger traffic, to assist further research into the field.
4. The model default values, i.e. discount rates, annual insurance rates, depreciation periods, lost times, be updated for the ever changing economic and political conditions, which are a big problem faced by the airline industry
5. Further study and research need to be done to the model, in its application of creating a hub and spoke network within Africa, as a way of consolidating passenger traffic to lower costs.