CHAPTER 1

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INTRODUCTION

Air transport plays a role not only in providing rapid communications, but also in mobilising the national resources by stimulating investments, expansion of commerce and foreign trade and promoting tourism, thereby enhancing the economic development. In a country of the size of India, where major industrial, commercial and tourist places are far apart and the transport services have to contend with a variety of terrain and climatic conditions, civil aviation can play an important role. Air travel saves travelling time due to its being the speediest mode of transport as compared to the other modes of transport, namely, roadways and railways. The civil aviation also provides direct and indirect employment and helps to earn foreign exchange for a country like India, which often faces the balance of payment (BOP) problem.

The civil aviation can play an effective role in national economy only if it is financially sound. That is, while serving the customers' needs, it should also be able to make a reasonable return on capital employed so as to provide for its own future expansion.

In India, the Indian Airlines had almost absolute monopoly over the domestic air services till 1991. Even after having come a long way since its nationalisation, it

started making consistent losses year after year from 1989-90 onwards. There have been frequent imbalances between demand and supply of the air services in the past. Further, there has been failure on the part of the Indian Airlines to effect cost control measures. The Indian Airlines has also been plagued with the problem of overstaff, aging fleet and unviable routes. However, very little has been done to tackle these problems. On the contrary "In the past five years over 2000 members have been added to its staff".[1] The Indian Airlines has to incur extra cost due to its aged fleet. Aging fleets are costly because they require more staff and materials to take care of them. Moreover, their utilisation is also low. Unviable routes have been the other cause of increasing cost. Such routes are mainly operated due to political reasons rather than social or economic reasons. The Indian Airlines thus, has tremendous scope for cutting down the cost of operation. However, the Indian Airlines instead of making serious efforts to cut down avoidable costs, has resorted to fare hikes to cover its inefficiency. Ultimately this inefficiency is passed on to the consumers by fare hikes, adversely affecting the natural growth of the air transport market. "By resorting to such steep hikes, the Indian Airlines is only further reducing the size of the domestic market, which in the absence of competition is not growing".[2]

Poor financial performance of the Indian Airlines has come in the way of the need and the demand based expansion of not only the Indian Airlines but also the whole domestic airlines industry. Competition with loss making and the government supported airlines has only discouraged the private airlines. The government's attempts to keep the Indian Airlines floating has resulted in a civil aviation policy,

which is against the interest of others. "Government present policy is singularly unimaginative and utterly ruinous for all. As for the devious 'new aviation policy', its sole aim is to keep Indian Airlines alive. There is no long-term programme to meet the country's air transportation needs".[3] From the foregoing discussion it follows that the Indian Airlines should improve its financial performance.

In the year 1991, under the open sky policies, the government allowed the entry of private operators in the industry. Consequently, the share of private airlines in the total market gradually started increasing. However, liberalisation of domestic airlines industry brought more operators in the industry than required. Most of these airlines had insufficient finance and no professional experience of aviation business. Moreover, these airlines had to face stiff competition from the government protected Indian Airlines. Ultimately, many private airlines had to suffer the financial losses and had to quit the industry.

In view of the unsatisfactory performance of the Indian domestic air transport industry, an attempt has been made in this study to analyse the performance of the civil aviation to provide some policy prescriptions.

The analysis in this study confines to the Indian Airlines due to non-availability of the required and sufficient statistics of the private airlines. However, the exclusion of private airlines from the analysis would not affect the result much as the period chosen for the study does not reveal significant inroads made by the private airlines

in domestic air transport. The share in 1991-92 was as low as 0.5 per cent, which increased to 8.74 per cent in the year 1992-93. Only in the last year of the study period (1993-94), the share of private airlines became significant at 25 per cent. So far as the effect of entry of private airlines on the performance of the Indian Airlines is concerned, in view of lack of competition in complete sense, it cannot be much, except for share in the market, which is also kept under control by the government. The government policies have been framed in a way to keep competition far from affecting the performance of the Indian Airlines adversely. For instance, under the amended policy in early 1997, the government raised the minimum fleet size requirement from three to five. This measure posed a formidable barrier to entry, and threat to the existence of small airlines; as such airlines cannot become or remain viable without adequate growth opportunities. So long as there are government owned airlines (Air India, Indian Airlines and Pawan Hans), there cannot be transparent administration and level playing fields for competition to take seed.[4]

1.1 OBJECTIVES OF THE PRESENT STUDY

The main objective of the present study is to make an analytical assessment of deficiencies in Indian Airlines operation by scrutinizing the behaviour of revenue, cost and profitability. With this objective in mind, demand, cost and the profitability functions for the Indian Airlines are estimated so as to indicate the factors affecting its performance. Such indication of factors will help in framing appropriate policy for the Indian Airlines especially now as it is one of the competitors in supplying air

transport services. An appropriate pricing policy for the Indian Airlines is also examined.

The purpose of estimating the demand function for passenger and cargo services is to ascertain the factors affecting the same and suggest some policy implications. The knowledge of cost function of the industry helps in deciding a sound pricing policy, optimal subsidy, efficient size of the plant, input mix of different factors etc. Profitability function is estimated to understand the major determinants of profitability. This will help to suggest a policy to improve profitability.

1.2 SOURCES OF DATA AND METHODOLOGY ADOPTED

A. Data

For the purpose of this study, the main sources of data are as follows:

- 'Annual Report' of the Indian Airlines, various issues.
- 'Air Transport Statistics' published by the Air Transport Directorate, New Delhi, various issues.
- 'India Database' by H. L. Chandhok and the Policy Group (1990).
- 'Center for Monitoring Indian Economy' (CMIE), Bombay, various issues.
- Government of India, 'National Accounts Statistics' various issues.
- Government of India, 'Handbook of Industrial Policy and Statistics'.

B. Methodology

For analysis of the data so collected, a number of statistical tools are applied for examining the demand, cost and the profit structure of the Indian Airlines.

The demand functions for passenger and cargo services are estimated using the 'Ordinary Lest Square' technique of regression with the output in physical and monetary terms both. The methodology adopted for estimating the demand functions for passenger and cargo services for the Indian Airlines is similar to that of the Tata Economic Consultancy Services (1986). But unlike the Tata Economic Consultancy Services, which used only the physical measure of output for the analysis, the present study has also made use of monetary concept of output to find the consistency between the two alternative results; and also to estimate a relationship between revenue earned and price.

The total cost function is estimated in the translog form. This is so because it places a no priory restrictions on substitution possibilities and also allows scale economies to vary with the level of output.

Following the standard practice, the translog cost function is estimated along with the share equations, applying the maximum likelihood technique. However, as for each observation the sum of the dependent variables over all share equations always equals unity, it makes the disturbance covariance matrix of the share equations singular. To overcome the problem of singularity of the contemporaneous

covariance matrix, one of the share equations in estimation is deleted. The resulting maximum likelihood estimates are invariant to the equation deleted (Barten, 1969).

The Profit function is estimated with the help of the 'Ordinary Least Square' technique of regression by regressing return on capital employed on some of its main determinants such as profit margin ratio, sales turn over ratio etc.

1.3 TIME PERIOD OF THE STUDY

Time period 1964-65 to 1993-94 is chosen for the analysis in the present study. This time period is long enough to analyse the performance of the Indian Airlines in terms of various economic functions. The year 1964-65 is selected as the starting point of the study because the necessary data prior to this year is not available. In the year 1993-94 the organisation of the Indian Airlines was changed from a corporation to a public limited company, therefore, this year is taken as cut off year, so as to have continuity in the data.

1.4 LIMITATIONS OF THE STUDY

Although due care had been taken to restrict the limitation, yet a few limitations have become unavoidable.

The main limitation of this study is that it does not take into account all private air transport operators operating in India for analytical purposes. As mention earlier, this is because of the non-availability of the relevant statistics of the private airlines.

"The government of India had no procedure or machinery for collecting these statistics nor were the air taxi operators obliged to file returns to the government".[5]

Further, in the cost analysis the precision of the results could have been better if a variable on 'annual average distance flown per flight' as an attribute of output, had been incorporated in the model because this variable has effects on the total cost. This could have been arrived at by dividing the yearly total distance flown by the total number of flights taken off during the respective year. However, the non-availability of data with respect to total number of flights during a year forced the exclusion of this variable from the models.

The cost functions in this study are estimated with the theoretical assumption of 'cost minimisation'. However, for the Indian Airlines, this may not always hold true. Lack of competition and motivation does not guarantee the cost minimisation always Inability to quantify and account for such costs, in the cost functions estimated, is yet another limitation of this study.

1.5 LITERATURE SURVEY

Studies on domestic civil aviation in India are few and mostly deal with its history and growth. Some of these relevant studies are reviewed here so as to provide a justification for the present study.

With a view to rationalise the fare and freight structure in civil aviation industry, the government constituted a committee under the chairmanship of S. Lal[6] (1957). The committee after studying the prevailing fare and freight structure, suggested to the Indian Airlines to experiment with lower fares in order to promote sustain and improve profit.[7]

To investigate the Indian Airlines cost structure and to evolve a formula for determining the standard cost of the Indian Airlines, the government constituted a high power committee in the chairmanship of Wheat Craft[8] (1959). The main suggestions of the committee included developing cost consciousness among the officials of the Indian Airlines by introducing costing system and extension of subsidies to make up for their losses incurred on uneconomic routes.

Nawab[9] (1967) made a comprehensive study of the evolution of civil aviation in India from 1911 to 1966. He discussed the performance of the Air India and the Indian Airlines in post nationalisation era with the help of their annual reports. He also reviewed various reports of the government, related to Indian civil aviation. He noted that after the initial odds for a few years, the performance of the Indian Airlines improved considerably after nationalisation.

The Tata Economic Consultancy Services[10] (1986) in its study focussed on the demands for domestic passenger and cargo traffics. After identifying various factors affecting demands for passenger and cargo traffic, it separately estimated demand

functions for domestic passenger and cargo traffic. As regards to the passenger demand function, it identified gross domestic product and foreign tourist arrivals as the main factors explaining demand. In cargo demand function, the demand was explained by the cargo yield and time trend variables.[11]

'Air Tariff Committee Report'[12] (1989), examined the prevailing tariff structure of domestic air carriers and infrastructure facilities. The committee was also to suggest a price structure that will help to generate adequate resources for the development of this sector. This committee started with the review of historical studies in context to the Indian Airlines. It made an attempt to arrive at the long run marginal cost of A-320, A-300 and Boeing 737 aircrafts. In the light of theoretical background of pricing for public enterprises and declining long run marginal cost, it suggested a multi-part tariff structure for the domestic airlines. It noted that as the long run marginal cost of A-320 was the highest amongst all, a tariff based on long run marginal cost of A-320 aircraft would generate surplus revenues during the transition period. Thus, it recommended a shift to long run marginal cost based pricing in short-haul sector in a phased manner and on long-haul sector immediately.[13]

Rashid Jung[14] (1996) argued that in the demand function model provided by the Tata Economic Consultancy Services assumes demand factor and the changes in demand to be independent of internal decisions of the industry. He, thus, suggested to include supply and cost / yield as the additional variables in the model, which

would reflect the internal decisions of the industry. Rashid Jung appreciated the demand forecast model developed by Ms. Jung at the University of Surrey (UK), where she had included these two variables additionally by a combined factor - Seat Factor and Fare Index.[15]

In February, 1995, the government of India constituted a committee of experts under the chairmanship of Dr. Vijay Kelkar[16] to make a comprehensive examination of the reasons for the losses of the Indian Airlines and develop strategies for turning around Indian Airlines in the context of a competitive market environment. The committee (1996) identified few of the main reasons leading to losses of the Indian Airlines after 1989-90. The committee, after discussing various aspects, recommended a number of measures for the Indian Airlines in the form of financial strategy, route and network rationalisation, organisation restructuring, industrial relations, role of the government etc.[17]

Rao and Rao[18] (1997) in their studies, started with the review of research and literature related to the airlines. They, however, noted that such studies are meagre in the context of the Indian Air Transport. Further, they observed that the "studies on Indian Airlines are limited to those conducted from time to time by Parliament Committees on Public Undertakings on certain aspects specifically assigned to them".[19] They provided the history and trends of the Indian civil aviation. Besides discussing the profile of Indian Airlines, route network and reliability of operations, they also discussed the performance of the Indian Airlines in both physical and

financial terms by considering a study period between 1978-79 and 1987-88.[20] They measured manpower utilisation in terms of available ton kilometre per employee. Utilisation of all other materials was examined in terms of stock held per average tonnage kilometre. The financial performance was discussed with the help of trends in profit and profitability.

They noted improved utilisation of different types of employees of the India Airlines during their study period. They also observed that the materials consumed per available ton kilometre did not change much in this period. During this period, profit and profitability also increased, which they contributed to increase in fares rather than the reduction in costs. It was also observed by them that no measure was taken by the Indian Airlines to improve the cargo traffic. They suggested that aircrafts with high cargo potential should be withdrawn from the routes where cargo potential is low and should be deployed where it is high. For low cargo potential routes new aircrafts with smaller capacity should be inducted. Rao and Rao further suggested compensation to the Indian Airlines by the government for the loss of revenue resulting from concessional fare to different categories of customers.

In the studies cited above, various aspects of the Indian Airlines are discussed in isolation. Although attempts have been made to estimate demand functions for passenger and cargo traffic in some of the studies, none of the studies has made an attempt to derive economies of scale for the firm as a whole. Nor there has been any attempt made to estimate elasticities of substitution between different factors and

elasticities of demand for these factors of the Indian Airlines. An analysis of technical change in the Indian Airlines is also lacking. Even though financial performance of the Indian Airlines has been discussed by many studies, the quantitative relationship between profitability and its determining factors has not been addressed.

The present study, therefore, makes an attempt to fill this lacuna by analysing the major aspects of the Indian Airlines.

1.6 DEFINITIONS

Some of the main terms employed in this study needs to be defined here because they are peculiar to transport sector in general and civil aviation in particular.

Stage: A section of the air service between two scheduled stops.

Average Stage Length: The weighted average of stage or sector length flown by an airline. This is obtained by dividing an airline's total annual aircraft-kilometres by the number of aircraft departures or flights recorded during the year.

Ton Kilometre: It is a unit of measuring traffic and is equivalent of the carriage of one ton of load over one kilometre. This devise helps one to add different types of traffic when carried over different distances.

Available Seat Kilometre (ASK): This is obtained by multiplying the seats available on a flight by the stage distance.

Available Ton Kilometre (ATK): Product obtained by multiplying the capacity in tons available for passengers, mail, and cargo by the distance in kilometres, flown by the aircraft. It, therefore, represents the maximum traffic that can be carried.

Revenue Ton Kilometre (RTK): The actual traffic carried on which revenue is earned.

Yield : Measures the average revenue obtained per ATK or RTK.

Passenger Yield (PYD) : It is the average revenue per passenger-kilometre or passenger ton kilometre. It is obtained by dividing total passenger revenue by the total passenger kilometres or passenger ton kilometres.

Cargo yield (CYD) : This is obtained in the same way as the passenger yiled.

1.7 CHAPTER SCHEME

The present study has been divided in six chapters.

The first chapter – the present chapter states the problem and the objectives of the present study. In this chapter the sources of data, the methodology adopted,

limitations of the study and the survey of literature are discussed. Definitions of some main terms employed in the present study are also mentioned here.

The second chapter of the study provides historical background of the evolution of the commercial domestic civil aviation in India. This chapter also provides an overview of the performance of the Indian Airlines with the help of some physical and financial indicators.

Chapter three deals with the revenue structure of the Indian Airlines. The chapter has been divided into two parts: the pricing of and the demand for the Indian Airlines services. It attempts to examine an appropriate price structure for the Indian Airlines in light of some alternative theoretical base provided by economic theory. It also attempts to establish demand functions for passenger and cargo services separately, with the output in physical and monetary terms.

Chapter four examines the trends and structure of cost of the Indian Airlines. It provides a theoretical base for the cost function and estimates a translog total cost function. From this cost function the results which have been derived include economies of scale, elasticities of substitution between factors, price elasticities of demand for factors and the structure of cost function.

Chapter five deals with the performance and determinants of profitability of the Indian Airlines. Performance is discussed in both financial and physical terms. Then

an attempt is made to identify some major determinants of profitability and estimate a relationship between profitability and its major determinants.

The last chapter provides a summary and conclusion of the present study, and suggests certain policy measures.

NOTES AND REFERENCES

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6. Government of India, Air Transport Council : Report of the Indian Airlines Corporation on Fare and Freight Rates, New Delhi, 1957.

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14. Jung, Rashid : "Growth Prospects of the Air Transport Sector" in National Conference on Indian Air Transport Industry, Confederation of Indian Industry, New Delhi, July 16-17, 1996.

15. See Chapter 3 for details.

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17. See chapter 2 for details.

18. Rao, D. P. and G. V. Rao : Indian Airlines -- A Study of Its Performance, Inter-India Publications, New Delhi, 1997.

19. Rao, D. P. and G. V. Rao : ibid., p. 61.

20 It may be noted here that this is the latest published work, comprehensively devoted to the Indian Airlines.