CHAPTER 5

Chapter 5

PERFORMANCE AND DETERMINANTS OF PROFITABILITY OF

INDIAN AIRLINES

5.1 INTRODUCTION

The profitability of an organisation under competitive conditions is an indication of efficiency in the utilisation of resources. Higher the profitability, the more efficient the firm is and vice-versa. In case of public sector of public utility in nature, however, profitability as reflected by the financial performance alone should not be considered a sufficient indicator of efficiency.[1] This is because in such cases there is lack of competition, obligation of running uneconomic services, lack of freedom in fixing prices in response to increasing cost of production etc. To assess the efficiency of such enterprises, therefore, besides profitability, efficiency should also be measured in terms of minimum utilisation of resources for the fulfillment of the given aims of these industries.[2]

Thus, in this chapter, the performance of the Indian Airlines is discussed with the help of some financial indicators along with the indicator of utilisation of various factors in physical terms.

In chapter two it was argued that a public sector enterprise should aim at earning a reasonable rate of return on capital invested; besides fulfilling some social

objectives. Thus, the profitability was also regarded as one of the prime objectives of public enterprises. In this chapter, an attempt is made to identify some main determinants of profitability and estimate a profitability function for the Indian Airlines.

5.2 BACKGROUND FOR ASSESSING FINANCIAL PERFORMANCE

Financial performance is generally assessed in terms of profitability of a business. The terms - profit, profitability, networth and capital employed can be defined in number of ways, depending upon the purpose of study and availability of data at hand. Therefore, it is imperative to discuss the definitions of these terms.

5.2.1 Definitions of Major Financial Terms

Profitability

Profit is defined as the difference between the total receipt and the total expenses. This difference when expressed as a proportion of capital employed, sales etc. describes profitability of a business. Profitability thus indicates the profit earning capacity of an organisation.

An analysis of profitability reflects the profit position resulting from the total transactions during the financial year. This analysis, in turn, assists the supplier of funds on the one hand and the management on the other in taking various decisions.

Profit

The term profit is defined in different ways by accountants and economists. The difference between accountant's and the economist's interpretation of profit arises due to inclusion or exclusion of the implicit costs. Economists argue that the cost of production should not only include explicit cost but it should also include implicit cost. They hold the view that the implicit wage, interest and rent should also enter into the cost of production. But to an accountant these items do not enter into the cost of production, as owner of a business may not make payment to himself in form of wages, interest and rent for the labour, capital and land respectively he himself has supplied to his own business. These payments not being made do not enter into an accountant's cost.

However, the difference between these two concepts of profit disappears with the separation of the functions of management, capitalist and landlord from that of the entrepreneur. In a large business, management, capitalist and landlord are separated from the ownership. In such a case obviously, there will be no implicit cost, all cost become explicit only and profit is considered to be a function of risk taking ability of the business. There are many risks associated with the operation of the business. All these risks can be classified into two broad categories, predictable and unpredictable. Predictable risks are those risks, which can be ascertained with the statistical probability, and thus they can be insured and the premium paid for insurance enters into the cost of production. However, against these, there are risks, which cannot be ascertained with statistical probability and thus, are uninsurable.

Such risks are mainly associated with the risks of competition, technical progress, business cycles and government policies.[3] Prof. Frank H. Knight calls these non-insurable risks as uncertainties. According to him profit is the reward for undertaking and managing such uncertainties of the business.

There are two popular concepts of profit namely the gross and the net profit. Depending upon the purpose of the study and the availability of the data, these two concepts of profit can be defined in number of ways.

A) Gross Profit

For the purpose of the present chapter, the following two definitions of gross profit can be considered:

a) The gross profit can be defined as the difference between the total income and the total expenditure. This difference is inclusive of the interest charges, depreciation, provision for taxation, dividends and the retained profits.[4]

b) Similarly, according to the Federal Trade Commission of U.S.A. the gross profit is the "earnings of a business unit less operating expenses and returns from outside investment. Interest on funded debt and federal taxes are generally included in the net earnings".[5]

Of the above two definitions of gross profit, which will be selected, depends upon the consideration of the following items:

i)   Depreciation

The treatment of depreciation in the definition of profit depends upon the treatment given to the definition of the total capital employed. If profit is linked to the net fixed assets rather than the gross fixed assets in the definition of total capital employed, then the depreciation charges should be excluded from the gross profit.

ii)   Taxation

If the objective of the study is to show the net return accruing to an entrepreneur, then profit after tax should be calculated. However, if the study aims at finding the efficiency of the total capital employed then the profit before tax should be taken into account.

iii)   Interest charges

If the purpose of the study is to show the profit on equity capital from an individual investors' point of view, then the interest charges should be deducted from profit as interest charges on borrowed capital are cost items to an entrepreneur. In this case, net profit as a proportion of net worth would be the best indicator of performance. However if, the study aims at finding the efficiency of the total capital employed then the interest charges should be included in the definition of profit.

iv)   Non-Operating Income

It is the income generated from other than the main operation of the business. It may include items like interest income from investment, income from assets sold or scrapped, income resulting from foreign exchange gain etc. If the intention of the study is to find the efficiency of a business with regards to its main operation then these items should not be included in the definition of profit, as such incomes are not from the main activities of the business.

B) Net Profit

The net profit before tax can be defined as the gross profit minus interest charges minus depreciation.

The method of defining the two concepts of profit for the present analysis is discussed below.

i)   Gross Profit

Gross profit as defined in this study is the profit comprising of interest charges (short and long term both), provision for taxation, dividends, retained profit and other non-operating expenses but net of depreciation charges. Depreciation charges have been deducted from profit because the concept of capital employed used in this study is also net of depreciation.

Profit is, thus, inclusive of all non-operating expenses. Provision for taxation and the interest charges have been included in the profit because the intention was to find the earnings of total capital employed. It can be noted however, that the other item of non-operating expense 'foreign exchange loss' has not been included in the definition of profit, as this is not related with the operation of the business.

All the items of non-operating revenue have been excluded from the definition of profit. Interest income has been excluded because outside investment has not been considered in the definition of capital employed. Similarly, the income from foreign exchange gain, assets sold / scrapped have not been included in profit as these do not result from the main activities of the business.

In light of the purpose of the present study, therefore, the second definition of gross profit, mentioned above, has been taken into account in this chapter.

ii)   **Net Profit**

Net profit here is defined as the gross profit (which is net of depreciation) net of interest charges and taxation. Hence, the net profit comprises of dividend and retained profits only. Net profit as a proportion of net worth has been used to assess the performance of the Indian Airlines.

As the present chapter aims at assessing the overall performance and not just the net-profit of the Indian Airlines, only the gross concept of profit has been used for econometric analysis.

Capital

Capital refers to the produced means of production. In other words the capital is that factor of production, which is "Produced by the economic system and used by the economic system for further production".[6] The term capital is also used to represent an individual's command over the financial resources. Thus, the concept of capital has two meanings associated with it.

Within the financial perspective, depending upon the data availability and the purpose of the study, the term capital is defined in number of ways. The following two definitions of capital are commonly used:

a) Total capital, according to Monopolies Commission in England, is the net fixed assets plus the current assets (except goodwill), minus current liabilities and provision.[7] This definition, in other words, adds the net working capital to the net fixed assets to arrive at the measure of capital employed. This it does because both the net working capital and net fixed assets represent the earning capacity of a firm.

b) If there is data restriction, there is also a slightly different version of the concept of capital employed. The Taxation Enquiry Commission and the Reserve Bank of

Indian in their studies on company finances defined total capital as the net fixed assets plus all the circulating or current assets of the business.[8]

In the present chapter, the two concepts of capital used are discussed below.

A) Total Capital Employed

The first definition, which is a technically regarded as the more correct measure of capital employed, could not be followed in the present study. This is because in the definition of profit the present analysis has not only included the interest charges on long-term but also on short-terms borrowings due to non-availability of data separately on these two items. If the current liability is deducted from the current assets, short-term loans also gets deducted. This has compelled the present analysis to include total current assets instead of net working capital along with the net fixed assets, in the definition of total capital employed.

Further it should be noted that the following two items of the assets side of the balance sheet have not been included in the definition of the total capital employed:

i) Investment

Investment being outside the main activities of the business has not been included in the definition of capital employed. Therefore, the non-operating income in form of interest from such investment has also been kept out in the revenue side.

ii) Assets Earmarked against Deposits held on Account of Others

These assets include government securities and call fixed deposits with banks. Interest on such deposits is also a source of non-operating income. As the study in present chapter has not included the non-operating income in the definition of profit, this item also is not included in the definition of total capital employed.

B) Networth

Networth here refers to the equity paid up capital plus reserves and surplus less accumulating losses, if any.

Having defined the terms profit and capital used in the present chapter, trends in some main indicators of the financial performance are explained below.

5.3 TRENDS IN FINANCIAL PERFORMANCE OF INDIAN AIRLINES

The financial performance of the Indian Airlines is examined below with the help of four indicators, viz. gross profit, net profit, return on capital employed and return on networth.

i) Gross Profit

The gross profit in the year 1964-65 was Rs. 16.39 million, whereas the same in the year 1993-94 was Rs. − 707.27; a decline of 4416 per cent. In Table 5.1 it can be observed that in the initial years there have been frequent fluctuations in the gross profit. This is understandable as the Indian Airlines was still trying to overcome the

initial odds it faced when it took over, and the political upheavals the country had to undergo. The period between 1974-75 and 1987-88 was, however, better as for most of the years during this period profit showed an increasing trend. However thereafter, the profit declined sharply year after year to register the all time low of Rs. -788.88 million in the year 1992-93. Thus the year 1987-88 is the turning point of the one of the longest financial crisis of the Indian Airlines. In the year 1988-89 there was decline in profit mainly due to increase in the foreign exchange rate, shortage of capacity and the operating expense increasing at a faster rate than the operating revenue. While the shortage in the capacity was made up with the induction of A-320 aircraft in phased manner from July 1989, the industrial unrest and the grounding of A-320 aircraft in the ending part of the year affected the financial performance of the year 1989-90 adversely. The continued suspension of A-320 aircraft was again the main cause of the adverse financial performance during the year 1990-91. Financial performances were again badly affected during 1991-92 due to the all-round increase in cost and the increase in operating revenue falling short from the increase in operating expenses. During the last two years of operation, the Indian airlines suffered losses mainly due to the loss of market share resulting from entry of private operators and the higher burden of depreciation due to additional induction of A-320 aircraft.

ii)   Net Profit

The net profit over the study period has declined from Rs. 9.04 million to Rs. -2920.58, which is a decrease of 32409 per cent. As was noted earlier, the difference

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between the gross profit and the net profit is by the extent of the expenses on account of interest and the taxes. Referring to Table 5.1 it can be observed that there are two noticeable periods, 1979-80 to 1980-81 and 1989-90 to 1991-92, when the Indian Airlines incurred net losses in spite of relatively better level of gross profit. In the first period this difference is mainly caused by taxes, whereas in the second period this is due to heavy interest payment resulting from the induction of A-320 aircraft

Table 5.1 : Gross and Net Profit of Indian Airlines

(Rs. in million)

Year	Gross Profit / Loss	% change over 1964-65	Index	Net Profit / Loss	% change over 1964-65	Index
1964-65	16.39		100.00	9.04		100.00
1965-66	0.17	-98.98	1.02	-3.86	-142.75	-42.75
1966-67	-27.83	-269.83	-169.83	-39.25	-534.20	-434.20
1967-68	13.26	-19.11	80.89	-6.73	-174.41	-74.41
1968-69	35.71	117.90	217.90	13.79	52.54	152.54
1969-70	33.77	106.10	206.10	11.50	27.18	127.18
1970-71	-19.99	-221.97	-121.97	-49.75	-650.35	-550.35
1971-72	-11.94	-172.89	-72.89	-53.46	-691.40	-591.40
1972-73	36.02	119.83	219.83	-12.53	-238.65	-138.65
1973-74	22.38	36.58	136.58	-30.37	-436.02	-336.02
1974-75	29.34	79.01	179.01	-10.35	-214.53	-114.53
1975-76	111.73	581.79	681.79	63.30	600.25	700.25
1976-77	201.75	1131.13	1231.13	154.19	1605.74	1705.74
1977-78	227.21	1286.53	1386.53	126.42	1298.48	1398.48
1978-79	267.75	1533.91	1633.91	115.81	1181.15	1281.15
1979-80	136.48	732.82	832.82	-46.20	-611.14	-511.14
1980-81	205.94	1156.72	1256.72	-64.89	-817.84	-717.84
1981-82	565.25	3349.40	3449.40	200.81	2121.48	2221.48
1982-83	668.84	3981.53	4081.53	255.05	2721.56	2821.56
1983-84	907.14	5435.72	5535.72	519.21	5643.77	5743.77
1984-85	997.72	5988.47	6088.47	590.35	6430.79	6530.79
1985-86	979.15	5875.14	5975.14	665.08	7257.46	7357.46
1986-87	1011.58	6073.05	6173.05	765.38	8367.05	8467.05
1987-88	1067.00	6411.23	6511.23	865.46	9474.23	9574.23
1988-89	936.00	5611.86	5711.86	700.49	7649.24	7749.24
1989-90	741.07	4422.33	4522.33	-260.68	-2983.78	-2883.78
1990-91	507.72	2998.33	3098.33	-828.42	-9264.45	-9164.45
1991-92	183.28	1018.44	1118.44	-1696.28	-18865.23	-18765.23
1992-93	-788.88	-4914.05	-4814.05	-2608.16	-28952.91	-28852.91
1993-94	-707.27	-4416.07	-4316.07	-2920.58	-32409.12	-32309.12

Source· Derived From various <u>Annual Reports</u> of the Indian Airlines, New Delhi.

iii) Return on Capital Employed

Like any public sector of public utility nature, in case of the Indian Airlines also one finds the return on capital either very low or even negative. This happens because the Indian Airlines had to serve uneconomic routes also, besides sometimes bearing the brunt of the irrational decisions of the government. If the government provides subsidy to compensate for this, there would have been no problem. However, the Indian government does not accept the idea of providing subsidy to such businesses. This leads to lack of internal resources for replacing the old vehicles. Consequently, the average age of the vehicle is increased which in turn increases the unit cost of operation resulting into losses and greater reliance on the government for financial needs

The estimate of return capital has been arrived at by dividing the gross profit by the total capital employed. Table 5.2 shows that the return on capital for the Indian Airlines has been either very low or negative for the initial and the last few years of the study period. Further it can be noted that only during two short periods, viz., 1975-76 to 1978-79 and 1981-82 to 1987-88, return on capital has been over 9 per cent per annum. This is understandable, as the Indian Airlines is required to serve many uneconomic routes also. During 1990-91 it suffered losses due to irrational decision of the government, grounding the entire fleet of A-320 aircraft. Low or negative return on capital has resulted into insufficient funds for the replacement of the existing aged aircraft. The average age of the aircraft in the Indian Airlines is high making higher unit cost of operation and lower return on capital employed.

iv)　　**Return on Networth**

Return on networth has been calculated by dividing the net profit after interest and tax by the networth. Table 5.2 also depicts the return on networth for the Indian Airlines. There have been frequent fluctuations in the return on networth until 1983-84; when it was the highest of all time figuring 24.10 per cent. Thereafter, with just one slight exception in the year 1987-88, it has continuously declined.

Table 5.2 : Returns on Capital Employed and Networth in Indian Airlines

Year	Return on Capital Employed (%)	% change over 1964-65	Index	Return on Networth (%)	% change over 1964-65	Index
1964-65	5.74	.	100.00	3.61		100.00
1965-66	0.05	-99.12	0.88	-1.55	-143.06	-43.06
1966-67	-5.81	-201.19	-101.19	-17.56	-587.01	-487.01
1967-68	2.60	-54.78	45.22	-3.04	-184.32	-84.32
1968-69	6.59	14.83	114.83	4.96	37.46	137.46
1969-70	5.81	1.22	101.22	3.42	-5.11	94.89
1970-71	-2.42	-142.24	-42.24	-12.41	-444.23	-344.23
1971-72	-1.37	-123.88	-23.88	-14.94	-514.28	-414.28
1972-73	3.97	-30.82	69.18	-2.93	-181.37	-81.37
1973-74	2.44	-57.48	42.52	-6.97	-293.28	-193.28
1974-75	2.86	-50.13	49.87	-2.28	-163.22	-63.22
1975-76	9.47	64.92	164.92	11.46	217.74	317.74
1976-77	10.12	76.34	176.34	20.38	465.17	565.17
1977-78	9.92	72.84	172.84	14.03	289.22	389.22
1978-79	9.32	62.32	162.32	10.56	192.79	292.79
1979-80	4.37	-23.95	76.05	-4.02	-211.57	-111.57
1980-81	4.69	-18.33	81.67	-4.56	-226.35	-126.35
1981-82	12.28	113.88	213.88	12.02	233.49	333.49
1982-83	10.85	89.04	189.04	14.70	307.66	407.66
1983-84	14.27	148.66	248.66	24.10	568.33	668.33
1984-85	14.80	157.78	257.78	23.84	561.20	661.20
1985-86	13.89	141.91	241.91	20.18	459.64	559.64
1986-87	13.61	137.17	237.17	20.01	455.03	555.03
1987-88	13.12	128.53	228.53	20.02	455.25	555.25
1988-89	6.86	19.47	119.47	15.39	326.92	426.92
1989-90	3.46	-39.72	60.28	-4.87	-234.96	-134.96
1990-91	1.96	-65.79	34.21	-14.81	-510.69	-410.69
1991-92	0.59	-89.75	10.25	-39.53	-1196.40	-1096.40
1992-93	-2.34	-140.83	-40.83	-75.63	-2197.55	-2097.55
1993-94	-1.84	-132.01	-32.01	-83.48	-2415.36	-2315.36

Source Derived From various Annual Reports of the Indian Airlines, New Delhi.

5.4 PHYSICAL PERFORMANCE OF INDIAN AIRLINES

Performance of an organisation can also be assessed by how well the factors have been utilised. Better productivity of a factor means that the expense of that factor is spread over to the larger units of output, which will result in lowering of the average cost and hence an improvement in the profitability of the business. Productivities of the main factors in context to the Indian Airlines are discussed under the following heads·

i)   Seat Productivity

The seat productivity is an important indicator of efficiency in airlines. Aircraft being the most important resource in the air transport business, its better use in terms of higher seat productivity determines to a large extent the efficiency and therefore, the profitability of the airlines. The seat productivity (SP), thus, is measured as:

$$SP = \text{Available Seat Kilometers} / \text{Total Available Seats}$$

Amongst the important factors determining the seat productivity are: efficiency of management, fleet size, operating length, network pattern etc. The extent of seat utilisation in the long run is mainly reflected by the efficiency of the management in decisions making. A proper management decision can always help in avoiding either the excess or the short supply of aircraft seat. In government enterprises, however, the decisions are taken with a view to fulfil other objectives also like

political, social etc. Thus, there is no surprise if the available seats are found more or less than what is required in such enterprises at a given point of time.

Available seat kilometre per seat shows an improvement over the study period, with some significant fluctuations vide Table 5.3. It was 0.65 million seat kilometre per seat in 1964-65, which improved to 1.1 million seat kilometre per seat by the year 1993-94, an improvement of 70 per cent. This improvement reflects that the corporation learnt better utilisation of seats over the study period. This improvement can also be attributed to the technological advancement, which enabled modern planes to perform more kilometres in a day than what the older aircraft like Dakota and others used to do.

It can also be noted that from the year 1988-89 onward the seat productivity has suffered and has fluctuated. In the year 1988-89 there was a reduction in the seat kilometres because of the grounding of two B-737 aircraft for repairing propose for a considerable period of time and a total loss of another aircraft of similar type in October 1988 at Ahmedabad. In 1990-91 following the Bangalore air crash the entire fleet of A-320 was grounded resulting in reduced supply. In subsequent years, available seat kilometres further suffered due to rising competition from the private operators for the passenger services. The seat productivity in last few years is also affected due to the fact that there was reduced trend in available seat kilometre from the year 1988-89 in spite of increasing seats with the inductions of A-320 aircraft.

ii) Labour Productivity

In the context of airlines, the most widely accepted indicator of labour productivity is the available ton kilometre per employee, a parameter that indicates the overall output of the airline per person employed in purely physical terms.[9] Thus, the labour productivity has been calculated from the output labour ratio (OLR), which can be written as:

OLR = Available Ton Kilometers performed / Total Labourers used

The higher this ratio better is the productivity of the staff and vice-versa. This indicator is influenced by various factors like the network characteristics, efficiency of work system, levels of automation / computerization etc

In Table 5.3, one can notice a gradual rise in labour productivity up to the year 1987-88. It rose from 0.01 million available ton kilometre per employee in 1964-65 to 0.06 million available ton kilometre per employee in 1987-88, an improvement of 291 per cent. However, this is improvement for the study period as a whole is of 233 per cent. In the last few years improvement in labour productivity has fluctuated and has shown deterioration to 0.05 million available ton kilometre per employee in the year 1993-94. The main reason for this is the fluctuation in available ton kilometre itself.

iii) Fuel Productivity

Fuel comprises a major portion of the total expenses in air transport and thus, the productivity of fuel consumption determines to a large extent the profitability of the business. The productivity of fuel consumption can be judged on the basis of the rate of fuel consumption (RFC), which refers to the available ton kilometres per liter of fuel consumed. It has been calculated as:

RFC = Available Ton Kilometers/ Total Fuel Consumed.

Larger the kilometres obtained per liter of fuel, better would be the profitability and vice-versa. The rate of fuel consumption is mainly governed by the factors like the prevailing technology, age of the fleet, condition of the fleet, maintenance of the fleet, stage length etc. An airline can thus make a sustained effort to improve the rate of fuel consumption through these determinants.

Table 5.3 also indicates that the rate of fuel consumption has improved over the study period. Over this period available ton kilometre per kiloliter of fuel has increased from 1269.97 to 2043.09, an improvement of 61 per cent. Whenever the fuel-efficient planes have been inducted rate of fuel consumption has responded positively; and when these planes have grown older, rate of fuel consumption is affected adversely until there is further introduction of new aircraft. There is an improvement in rate of fuel consumption in the year 1967-68 when four aircraft of HS-748 were introduced. Similar improvements in rate of fuel consumption can be

noticed from 1970-71 when B-737 were inducted in the fleet. There is a sharp improvement in rate of fuel consumption from the year 1976-77 resulting from the induction of A-300 in the fleet. From 1989-90 onward one can notice another improvement, which is the result of the induction of aircraft A-320 in the fleet.

Having examined the performance of the Indian Airlines in terms of profitability; and also in terms of utilisation of its main resources, in the next section an attempt is made to identify some main determinants of profitability and estimate a profitability function for the Indian Airlines.

Table 5.3 : Productivities of Seat, Staff and Fuel in Indian Airlines

Year	ASK / Seat (000)	Index	ATK / EMP (000)	Index	ATK / KLL	Index
1964-65	646.57	100.00	14.22	100.00	1269.97	100.00
1965-66	616.14	95.29	13.07	91.94	1218.08	95.91
1966-67	610.00	94.34	13.37	94.03	1093.35	86.09
1967-68	658.18	101.80	16.06	112.93	1310.85	103.22
1968-69	680.40	105.23	15.80	111.14	1204.41	94.84
1969-70	711.79	110.09	16.50	116.01	1186.65	93.44
1970-71	555.21	85.87	14.71	103.44	1271.64	100.13
1971-72	792.63	122.59	17.57	123.59	1635.31	128.77
1972-73	1087.88	168.25	21.00	147.68	1776.46	139.88
1973-74	889.27	137.54	17.17	120.72	1828.16	143.95
1974-75	993.88	153.72	20.38	143.31	1563.78	123.13
1975-76	1201.68	185.86	23.62	166.14	1831.88	144.25
1976-77	1056.77	163.44	26.37	185.47	2114.79	166.52
1977-78	1157.91	179.08	31.81	223.73	2373.97	186.93
1978-79	1231.24	190.43	34.84	245.02	2477.98	195.12
1979-80	1274.30	197.09	34.72	244.19	2604.06	205.05
1980-81	1165.91	180.32	37.04	260.47	2277.73	179.35
1981-82	1248.28	193.06	40.37	283.94	1987.78	156.52
1982-83	1178.31	182.24	43.90	308.74	1942.85	152.98
1983-84	1228.82	190.05	45.37	319.03	1834.74	144.47
1984-85	1346.48	208.25	48.81	343.23	1817.32	143.10
1985-86	1477.70	228.54	51.40	361.45	1783.68	140.45
1986-87	1571.77	243.09	53.42	375.67	1628.68	128.25
1987-88	1657.78	256.40	55.54	390.59	1531.08	120.56
1988-89	1537.14	237.74	52.28	367.67	1522.51	119.89
1989-90	1295.28	200.33	52.15	366.76	1866.62	146.98
1990-91	980.82	151.70	41.97	295.13	1852.15	145.84
1991-92	1202.54	185.99	49.28	346.59	2032.32	160.03
1992-93	1042.27	161.20	43.03	302.58	2001.30	157.59
1993-94	1099.21	170.01	47.36	333.05	2043.09	160.88

Source. Derived From various Annual Reports of the Indian Airlines, New Delhi.

Notes   a) ASK = Available Seat Kilometre,   b) ATK = Available Ton Kilometre,   c) EMP = Employees, and d) KLL = kilolitre.

5.5 DETERMINANTS OF PROFITABILITY: INDIAN AIRLINES

There are number of factors which influence the profitability of an organisation. Some of these factors are non-quantifiable and some are quantifiable. Non-quantifiable factors include government decisions and interference, political, climatic and economic condition etc of the country. In context to the Indian Airlines the government's decision for example, with regard to grounding of the entire fleet of A-320 aircraft following the Bangalore air-crash in 1990 led to a loss of about Rs. 200 crores to the Indian Airlines. Similarly, prevailing political and economic conditions too have their effect on the profitability, directly or indirectly. The quantifiable factors include among other things, the profit margin ratio, the turnover assets ratio, yield etc. Any variation in these factors leads to variation in the profitability as well.

In this section an attempt is made to estimate a quantitative relationship between the rate of profit and these quantitative determinants of profit. This will help to understand the main factors determining fluctuation in profitability and accordingly suggest the policy decisions.

5.5.1 Methodology for estimating the Profitability Function

The following form of the profitability function for the Indian Airlines has been selected:

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$$\log (\text{ROCE}) = \beta_1 + \beta_2 \log (\text{PMR}) + \beta_3 \log(\text{STR}) + \beta_4 \log(\text{LOR}) + \beta_5 \log (\text{YD}) +$$

$$\beta_6 \log (\text{ATK})$$

Where,

ROCE = Return on Capital Employed, β_1 = Constant term, PMR = Profit Margin Ratio, STR = Sales Turnover Ratio, LOR = Labour Output Ratio, YD = Yield, ATK = Available Ton kilometre.

The above log-log multivariate regression model is estimated with the data for a period of 30 years from 1964-65 to 1993-94. The 'Ordinary Least Square' method of regression has been used to estimate these parameters.

5.5.2   Variables for Profitability Function: Rationale and Procedure

The variables are divided into dependent and independent variables.

A)   Dependent Variable

Return on Capital Employed

Return on capital employed (ROCE) measures the profitability of an organisation. This has been calculated as:

$$\text{ROCE} = (\text{Gross Profit} / \text{Capital Employed}) \times 100$$

The 'Du Pont Chart'[10] designed for management control, shows that return on capital / return on investment (ROI) is related to profit margin on the hand and the assets turn over ratio on the other. This relationship can be written as:

$$ROI = \text{Profit Margin} \times \text{Sales Turnover Ratio} \times 100$$

$$= (\text{Profit} / \text{Sales}) \times (\text{Sales} / \text{Total Capital Employed}) \times 100$$

In a public sector of public utility in nature, turnover of investment is usually low. Therefore to earn a certain rate of return on capital employed, the profit margin should be relatively higher. However, public utility character of the public sector does not allow a relatively high profit margin, which in turn explains the low / negative return on capital employed in most of the public sector organisations.

B) Independent Variables

The following variables are incorporated in the model as independent variables:

i)   Gross Profit Margin

Gross profit margin is the profitability ratio, which shows the relationship between profit and sales. It has been calculated as:

$$\text{Gross Profit Margin} = \text{Gross Profits} / \text{Sales}$$

A relatively higher gross profit margin is a sign of efficient management, because it implies that the cost of production of the firm is relatively low.[11] An increase in

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gross profit margin may be due to **a)** decline in cost of sales without a corresponding decline in sales price, **b)** Increase in sales price without a corresponding increase in cost of sales. A relatively low gross profit margin, on the other hand, may be due to one or more of the following factors: **a)** A high cost of production resulted from inefficient utilisation of resources, **b)** A low selling price.

ii) Sales Turnover Ratio

The Sales Turnover Ratio (STR), which measures the utilisation of investment, is also a measure of assessing the profitability of a business, though indirectly. It indicates sales per rupee of investment. This has been calculated as:

$$STR = Sales / Total\ Capital\ Employed$$

Higher this ratio better is the utilisation of the assets and vice versa.[12] Other things remaining the same, better utilisation of capital employed indicates larger revenues and hence better financial performance.

In should be noted here that in present chapter while the sales refers to the operating revenue, total capital employed refers to (as defined earlier) the net fixed assets plus the current assets.

iii) Labour Output Ratio

The Labour Output Ratio (LOR) indicates the requirement of labour per unit of output. It is the inverse of the output labour ratio, which measures the average productivity of labour. This ratio can be calculated as:

$$LOR = Labour / Output$$

Lower this ratio the lower would be the requirement of labour per unit of output and hence higher would be the profitability. Advancement in technology results into improved efficiency of labour over a period of time, which in turn gets reflected in terms of better profitability. Hence, there is expected to be a negative relationship between return on capital employed and the labour output ratio.

It would be useful to mention here that the capital output ratio and the fuel output ratio were also tried for inclusion in the model, as these ratios are equally important in determining the profitability. However, the results obtained with inclusions in the model gave their t-values, which were statistically not significant at 5 per cent level of significance as shown in appendix 5.1. This was not unexpected in view of relatively small improvement in productivities of the seat and fuel over the study period, as was seen earlier in this chapter in the productivity analysis of various factors of the Indian Airlines. Therefore, the capital output ratio and the fuel output ratio are not included the final model.

iv) Yield

Yield here is defined as the revenue earned per unit of revenue ton kilometre performed, and it has been measured at current prices. In other words, it is the price charged per unit of output sold. A price charged may have either positive or negative effect on profitability depending upon the elasticity of demand. When the demand is relatively inelastic, increasing price will increase the total revenue and thus the profit. However, in case of elastic demand, increasing price will have the effect of reducing profit by reducing the total revenue. As it was noted earlier in chapter 3 that the demand for passenger air services was inelastic in India, therefore a positive relationship between the yield and the return on capital employed can be expected in the case of the Indian Airlines.

v) Level of Output

Level of output also has its bearing on profitability. Keeping other things constant, an increase in the level of output in a decreasing cost industry would increase the profitability, but it will reduce profitability in an increasing cost industry. Therefore, so long as there is a positive relationship between return on capital and the level of output, it suggests a scope for expansion in the later. On the other hand, a negative relationship between these two would suggest that profitability could be improved if there is a reduction in the level of output. The available ton kilometre has been taken as a measure of output because this measure of output includes both passenger as well as cargo services.

5.5.3 Trends in Various Variables Used in Profitability Function

The trend in return on capital employed has already been discussed under the heading of financial performance earlier in this chapter. To avoid repetition, therefore, this has not been discussed here again. The remaining trends in data pertaining to the present analysis are discussed below.

i) Profit Margin Ratio

Profit as a ratio of sales shows some improvement with fluctuations until 1983-84. Thereafter, however, an almost continuous deterioration in this ratio is noticeable in Table 5.4 As compared to 1964-65 this ratio improved by 135 per cent by the 1983-84, and deteriorated by as much as -156 per cent by the year 1993-94. It should be noted that deterioration in this ratio went on taking place in spite of inductions of more efficient aircraft, various hikes in fares and some cost control measures adopted by the Indian Airlines from time to time. The steps taken by the Indian Airlines to bring about improvement were, however, not sufficient even to maintain the existing ratio. This therefore, suggests that the Indian Airlines management did not adopt efficient management practices. Steps could have then been taken through effective hikes in fares or through effective cost control measures or both to check the deterioration in this ratio right in the beginning.

ii) Sales Turnover Ratio

Sales turnover assets ratio shows frequent fluctuations as can be seen in Table 5.4. As compared to 1964-65, this ratio shows the greatest improvement of 41 per cent

in 1987-88, which changed into deterioration of 43 per cent in the year 1993-94. Deterioration in this ratio after 1987-88 can mainly be attributed to the increase in capital expenses due to induction of relatively more expensive aircraft A-320 and failure of the Indian Airlines to increase the revenue proportionately.

iii) Labour Output Ratio

In Table 5.4 it can be seen that the labour output ratio has declined by 70 per cent during the study period. It was 70 labour per million of available ton kilometre in the year 1964-65, which declined to 18 labour per million of available ton kilometre in the year 1987-88 before slightly increasing to 21.12 labour per million of available ton kilometre by the year 1993-94. During the study period output has been increasing at a much faster speed than the quantity of labour, implying a better and better utilisation of labour. While the output measured in terms of available ton kilometre increased by 570 per cent, the number of employees increased by only 101 per cent during the same period. From this one comes to the conclusion that the technological changes have been labour saving over the years.

iv) Yield

Table 5 4 also shows the trends in yield during the study period. The yield per revenue ton kilometre increased by 1113 per cent in between the year 1964-65 and 1993-94. It can be noticed that the increase in yield has been somewhat gradual until 1988-89. However, thereafter, there has been a rapid increase in yield mainly due to

fast increasing fares in these years. The price index of air turbine fuel (1980-81=100) which was only 119 in 1987-88, moved up to 295 in the year 1993-94.

v) Level of Output

The trend in available ton kilometre as a measure of output has already been discussed in chapter 2 with reference to Table 2.4.

Table 5.4 : Profit Margin Ratio, Sales Turnover Ratio, Labour Output Ratio and Yield of Indian Airlines

Year	Profit Margin Ratio (Rs.)	Index	Sales Turnover Ratio (Rs.)	Index	Labour output Ratio (Per ml. of output)	Index	Yield (Rs.)	Index
1964-65	0.072	100.00	0.799	100.00	70.33	100.00	2.09	100.00
1965-66	0.001	1.00	0.707	88.52	76.49	108.76	2.16	103.40
1966-67	-0.103	-143.44	0.564	70.55	74.79	106.35	2.27	108.79
1967-68	0.038	53.12	0.680	85.12	62.27	88.55	2.56	122.86
1968-69	0.089	123.87	0.741	92.70	63.28	89.98	2.62	125.43
1969-70	0.074	102.33	0.790	98.92	60.62	86.20	2.67	128.01
1970-71	-0.045	-62.53	0.540	67.56	67.98	96.67	2.76	132.12
1971-72	-0.021	-29.73	0.642	80.33	56.90	80.91	3.13	149.95
1972-73	0.051	70.83	0.780	97.68	47.62	67.71	3.31	158.46
1973-74	0.033	45.65	0.744	93.15	58.26	82.84	3.70	177.31
1974-75	0.031	42.53	0.937	117.24	49.07	69.78	4.51	216.19
1975-76	0.102	142.52	0.925	115.71	42.33	60.19	4.38	210.21
1976-77	0.158	220.21	0.640	80.08	37.92	53.92	4.59	220.30
1977-78	0.151	209.89	0.658	82.34	31.43	44.70	4.64	222.30
1978-79	0.147	204.00	0.636	79.57	28.70	40.81	4.67	224.03
1979-80	0.067	92.64	0.656	82.09	28.80	40.95	5.14	246.66
1980-81	0.072	100.18	0.651	81.53	27.00	38.39	6.81	326.46
1981-82	0 147	204.62	0.835	104.52	24.77	35.22	8.01	384.26
1982-83	0.147	204.06	0.740	92.64	22.78	32.39	8.63	413.53
1983-84	0.169	235.23	0.845	105.71	22.04	31.34	9.02	432.55
1984-85	0.165	230.09	0.895	112.03	20.49	29.14	9.09	436.03
1985-86	0.138	191.61	1.009	126.25	19.46	27.67	9.88	473.63
1986-87	0.123	171.52	1.105	138.28	18.72	26.62	10.58	507.12
1987-88	0.116	161.84	1.128	141.21	18.00	25.60	10.92	523.62
1988-89	0.098	135.89	0.702	87.92	19.13	27.20	11.40	546.34
1989-90	0.069	96.49	0.499	62.47	19.17	27.27	12.95	620.65
1990-91	0.045	62.89	0.435	54.39	23.83	33.88	16.07	770.52
1991-92	0.013	17.76	0.461	57.70	20.29	28.85	18.87	904.75
1992-93	-0.052	-72.57	0.449	56.26	23.24	33.05	22.08	1058.45
1993-94	-0.040	-56.17	0.455	56.98	21.12	30.03	25.31	1213.27

Source: Derived From various Annual Reports of the Indian Airlines, New Delhi.

5.5.4 The Empirical Results

The estimated profitability function and the inferences derived from it are discussed below.

$$\log(ROCE) = 8.4289 + 1.0040 \log(PMR) + 1.0248 \log(STR) - 0.38954 \log(LOR) +$$
$$\quad (5\ 455) \qquad 0.00002531* \qquad (28\ 074) \qquad (-2.143)$$

$$0.20400 \ \log(YD) - 0.44970 \log(ATK)$$
$$(4.641) \qquad (-2.895)$$

$$R^2 = 99.85, \qquad D_w = 2.14, \qquad \text{t-Statistics in brackets.}$$

Where, ROCE = Return on Capital Employed, PMR = Profit Margin Ratio, STR = Sales Turnover Ratio, LOR = Labour Output Ratio, YD = Yield, ATK = Available Ton kilometre, in brackets are the t- values. and * indicates Standard Error.

i)   All the coefficients are significant at 5 per cent level of significance.

ii) A healthy positive relationship between profit margin ratio and the return on capital employed can be noticed from the result. Result indicates that a given proportionate increase of profit margin would lead to almost the same proportionate increase in return on capital employed.

iii) A positive and significant coefficient associated with sales turnover ratio suggests that the profitability can be improved immensely if capital is utilised

more properly to generate the revenue. Greater utilisation leads to a higher revenue and a more efficient utilisation of capital asset.

Utilisation of the planes in the Indian Airlines has been poor. Utilisation measured in terms of the average daily flying time per aircraft in case of the Indian Airlines was 8 hours against 10.5 hours of the Jet Airways in the year 1997-98.[13] Aged aircraft of the Indian Airlines is one of the main reasons for relatively poor utilisation. It was noted in chapter 4 that the average age of the Indian Airlines fleet was 11 years in May 1998. Thus, there is a need to modernize the existing fleet of the Indian Airlines. The Kelkar committee felt that "without suitable augmentation and modernization of its aircraft fleet, IA would not be able to keep abreast of market requirements, and thus would be reduced from being the major airline in the country to a marginal entity, with a market share of 11% by FY 2002-03 and cash deficit mounting to around Rs. 800 crores".[14]

The annual utilisation of the Indian Airlines planes during 1990s has been poor mainly due to reduced availability of pilots. For A-320 and A-300 it has hovered around between 2100 hours and 2400 hours. According to the Kelkar committee report it should be 2700 hours per aircraft per annum.[15] The importance of utilisation of the planes can be gauged from the fact that "every 1000 hours of additional operation by A-300, A-320 and B-737

aircraft has the potential for incremental cash surpluses of the order of Rs. 13, Rs. 10 and Rs. 4 crores respectively".[16]

iv)   As expected, the result indicates a negative relationship between return on capital employed and the labour output ratio. A one per cent reduction in labour output ratio leads to 0.39 per cent increase the return on capital employed. An improvement in labour efficiency, reflected by the lowering of labour output ratio, thus, would go a long way in helping to improve the profitability of the Indian Airlines.

In the Indian Airlines there lies a scope of bringing this ratio down by cutting the excess employment of the staff. However, "there has been no worthwhile or sustained effort to reduce its staff strength of well over 20,000, which is a millstone around the airline's neck. ...Its employee productivity must be amongst the very lowest for any airline in the world".[17] It should be noted here that the excess employment of the personnel in the Indian airlines was also pointed out by the results of cost analysis in chapter 4.

v)   The coefficient associate with yield is positive, showing a scope of increasing fare to increase profitability of the Indian Airlines. This positive coefficient was expected in light of the result obtained in chapter 3, stating inelastic demand for passenger air services.

VI) The result shows a negative relationship between return on capital employed and the available ton kilometre. It may appear surprising in view of economies of scale with respect to this measure of output, as was noted in the previous chapter. But it can be recalled that results in previous chapter also indicated diseconomies of scale with respect to revenue output (RTK). Thus, the analysis in this chapter reveals that the benefits from technical economies in production are outweighed by the diseconomies of scale with respect to service utilisation. This in turn, speaks of a need for reducing the short-haul services and also increasing passenger fare to convert scale diseconomies into scale economies in utilisation of services.

vii) In view of competition and privatization of the Indian Airlines, it may be expected that the labour output ratio fall. Assuming other things remaining same, 5 per cent cut in this ratio would increase the profitability of the Indian Airlines by 2 per cent.

In this chapter it is observed that the Indian Airlines performed financially better during the period 1974-75 to 1987-88. However, thereafter the performance deteriorated continuously. Performance measured in terms of productivities of various factors revealed that it has improved for all the factors considered. The main determinants of profitability included gross profit margin, sales turnover ratio, labour output ratio, yield, and the level of output. A high positive relationship is observed between profitability and profit margin and also between profitability and

sales turnover ratio. The labour output ratio also indicated a positive relation with profitability. In view of the excess employees working in the Indian Airlines, this ratio can play an important role in improving its profitability. In spite of economies of scale in production of services, the profitability of the Indian Airlines show a negative relationship with the level of output produced. This is because there are diseconomies of scale with respect to service utilisation, as was noted in chapter 4. Therefore, to improve the profitability of the Indian Airlines, this scale diseconomies should be converted into scale economies by reducing the short haul services and also by increasing the passenger fare.

Having examined the various aspects of revenue, cost and profitability of the Indian Airlines in preceding chapters, the last chapter sums up the entire study.

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Appendix 5.1 : Regression Results of the Rejected Profitability Functions (Dependent Variable - Return on Capital Employed)

Sr No	Const.	PMR	STR	LOR	KOR	FOR	Yield	ATK	R²	Dw
1	8 2083	1 0040	1 0361	-0 37193	-0 01839	-0.0351	0.2164	-0.4627	99 88	2 16
	(4 885)	0 00003*	(17.61)	(-1 994)	(-0 136)	(-0 683)	(4.605)	(-2.936)		
2	8 6278	1 0040	1.0094	-0.36808	-0 07110	-	0.2158	-0 4725	99.87	2 15
	(5 591)	0 00003*	(23 00)	(-1.982)	(-0.646)		(4.612)	(-3.031)		
3	8 1286	1 0040	1 0418	-0 7643	-	-0.0391	0 2145	-0 4579	99.87	2.16
	(5 209)	0 00003*	(26.49)	(-2 105)		(-0 951)	(4.87)	(-3.021)		

Notes· a) t- values in parenthesis, b) * indicates standard Error, c) PMR = Profit Margin Ratio, d) STR = Sales Turnover Ratio, e) LOR = Labour Output Ratio, f) KOR = Capital Output Ratio, g) FOR = Fuel Output Ratio, h) ATK = Available Ton Kilometre.

Capital Output Ratio (KOR) and Fuel Output Ratio (FOR) are not included in the final model as these two have the t – values which are not significant at 5 per cent level of significant.