



**University of Bahrain
College of Business Administration
Department of Business Administration and Management**

**THE PROJECTED FINANCIAL IMPACT OF
PRIVATIZING THE AIRPORT AUTHORITY**

**AN EMPIRICAL RESEARCH INTO BAHRAIN CIVIL
AVIATION AFFAIRS**

**By
Ebtesam Mohd Al Shamlan**

**A project submitted in partial fulfillment of
the requirement of Masters Degree in
Business Administration (MBA)**

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DECLARATION

I declare that this project is the result of my own investigation and that it has not already been accepted in substance for any degree, nor is it being currently submitted for any degree.

Signed: _____ Date: _____
Ebtesam Moh'd Al – Shamlan (candidate)

The defense committee considers the Thesis titles:



THE PROJECTED FINANCIAL IMPACT OF PRIVATIZING THE AIRPORT AUTHORITY

AN EMPIRICAL RESEARCH INTO BAHRAIN CIVIL AVIATION AFFAIRS

Submitted by Ebtesam Moh'd Al – Shamlan to The Departments of Economics and Finance and Management and Marketing and accepted for the Master of Business Administration degree.

Thesis Committee Members:

Dr. Batool Asiri
Supervisor
Department of Economics and Finance
Bahrain University

Dr. Ahmed Khudair
Member
Department of Management and Marketing
Bahrain University

Dr. Nadhem Saleh
Member
Department of Economics and Finance
Bahrain University

ABSTRACT

In recent years, there has been an interest in private participation infrastructure. Lately this interest has spread to airports, which are major employers in many communities and directly effect thousands of airlines and millions of passengers every day. Even airports which are wholly government owned or privatized, are being run as competitive businesses which have a clear profit motivation.

The broad purpose of this research is to examine whether the Bahrain Civil Aviation Affairs (CAA) is functioning efficiently. The purpose should be achieved through the following: Identifying the existing problems in the functioning of CAA, evaluating the existing price structure, concerning aeronautical revenues, finding out the viability of privatizing the CAA and determining the future financial impact.

Secondary data is collected through an audited financial statement and annual statistic movement reports. Primary data is collected through questionnaire survey at the arrival area of Bahrain International Airport (BIA).

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NOTATION

Abbreviation	Description
ACI	Airport Council International
ATC	Air Traffic Control
BAA	British Airport Authority
BAS	Bahrain Airport Services
BBO	Buy Build Operate
BIA	Bahrain International Airport
BOOT	Build Own Operate Transfer
BOT	Build Operate Transfer
BT	British Telecom
BTO	Build Transfer Operate
CAA	Civil Aviation Affairs
CF	Cash Flow
CODAC	Colombia's El Dorado Airport
CPI	Consumer Price Index
DQM	Destination Quality Matrix
FAA	Federal Aviation Administration
FIG	Flughafen Immobilien Gesellehaft
FIR	Flight Information Region

GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GOE	Government Own Enterprise
ICAO	International Civil Aviation Organization
IRR	Internal Rate of Return
LDO	Lease Develop Operate
LRMC	Long Run Marginal Cost
MTOW	Maximum Take off Weight
NPV	Net Present Value
OFTEL	Office of Telecommunication
RPI	Retail Price Index
SOE	State Own Enterprise
SRMC	Short Run Marginal Cost
WACC	Weighted Average Cost of Capital
WLU	Work Load Unit

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

In recent years there has been an increase in interest in private participation in infrastructure. This began with the power sector, water supply and some modes of transport. Lately this interest has spread to airports. Airport privatization went global in the last two years, however, airport privatization is different from airline privatization. There is little ideological backing for privatizing airports and few claims have been made for the competitive benefit of share sales.

In 1997, the concept of airport privatization became fashionable. Around 50 countries are currently pursuing various forms of privatization of their transport infrastructure to private sector. Privatization would inject much needed capital into the aviation infrastructure because it would make airports more commercially driven, financially self-sufficient and increase competitiveness. And also, private sector involvement is a key element of economic growth worldwide.

The State of Bahrain's economy is heavily oil dependent. The production and its processing, account for about 80% of export receipts, 60% of government revenues and 30% of Gross Domestic Product (GDP). But in the last decade (90's) revenue started to decline, which lead to strong efforts being made to make Bahrain the commercial center in the Middle East, especially by developing communication and transportation facilities, to make Bahrain home to numerous multinational firms and businesses in the Gulf. Civil Aviation Affairs (CAA) contribute 10% of total government revenue and total communication and transportation contribute 7.1% to the total GDP, (Ministry of Finance statistics 1998).

1.2 WHAT IS AN AIRPORT?

An airport is an industrial enterprise and its elements and activities are facilitated for passengers, aircraft and freight. It acts as a forum for disparate functions and related activities that combine to facilitate air transport traffic and the interchange between air and surface transport.

An airport is a combination between runways for aircraft and terminals or buildings for passengers or freight. The majority of airport authorities around the world are owned by governments which operate the runways and terminals. Sixty six percent (66%) of airports receive some government assistance for airport infrastructure projects, while in

developing countries, airports are completely dependent on government funds for airport development.

Airport services and the facilities provided are divided into three groups: essential operational services, traffic-handling services and commercial activities.

a. Essential operational services and facilities:

Airport services are to ensure safety for both aircraft and airport users, and include Air Traffic Control (ATC) services to facilitate landing and over flying of aircraft, meteorological services, telecommunications, police and security, fire and ambulance services, including search and rescue, runway engineering and maintenance.

Such facilities and services are always provided by the airports directorate themselves or by local or government departments i.e. Civil Aviation Department. For example, most of ATC, meteorological and communication services at European airports are provided by government departments.

Police and security are concerned with passenger search, baggage search, access control etc, and are usually undertaken by specialist staff.

ATC and police/security are responsible for the major operational activities such as apron services, fire and ambulance services. Cleaning and maintenance are far less significant.

b. Traffic handling:

Handling activities are associated with the aircraft which have landed at the airport and it includes maintenance, engineering, cleaning, catering, and provision of power and baggage/freight loading activities. Other handling activities are concerned with providing all kinds of services to passengers, and baggage or freight handling between the terminal and aircraft. However, these handling activities can be provided by the airport authorities, airline or specialist handling agents. For example, in Amsterdam, Copenhagen, Dublin, Gatwick, Geneva, Heathrow, Marseilles, Nice and the Gulf, the airport authorities have no involvement in any handling services, while the airport authorities in Dusseldorf, Paris, Frankfurt, Milan, Rome and Vienna are directly involved in handling activities.

c. Commercial activities:

Airport commercial facilities are provided by concessionaires or rents that are collected from companies. Some airport authorities are directly involved in running commercial activities. For example, Aer Rianta, the Irish Airport Authority, operates the duty-free shops in all its airports.

The airport authority of Rome operates its duty-free shops and restaurants. At Dusseldorf, the airport authority operates the duty-free shop and the airport authority of Amsterdam provides catering outlets.

1.3 AIRPORT OWNERSHIP

a. Public (state) ownership with direct government control:

The majority of airports around the world are directly owned and operated by central or local government. The Civil Aviation Department, which is a single government department, operates country airport facilities which include ATC or meteorological services. In most of third world countries, airports are operated by the Civil Aviation Department, while some airports are jointly owned by civilian and military authorities and managed by military authorities.

In the United States, United Kingdom and Germany, some of their airports are owned by municipal or regional authorities, while in some cities such as Los Angeles and New Orleans, airport commissions run the airport.

b. Public ownership through an airport authority:

Some governments and municipalities, while maintaining ownership of their airports, have felt that they could be better operated and managed if those airports had greater autonomy (Doganis 1994).

The Government sets up an authority with professional and skilled personnel to undertake and implement long-range plans which are going to be under political control. Such authorities can operate an airport either at national, regional or at local level (example of authorities is presented in airport privatization literature review).

c. Mixed public and private ownership:

A number of airports are operated with an ownership between public and private sectors. For example, Italian airports operate a concession with both private and public shareholders.

Conton airport at Zurich in Switzerland, is the legal owner and operator of the airport while Flughafen Immobilien Gesellschaft (FIG) has taken over much of the work from Conton, as FIG constructed the majority of the buildings, undertakes maintenance, and manages and rents all land side facilities.

d. Private ownership:

Private ownership has been restricted in a number of ways. Private ownership is private in a legal sense, but does not have the commercial freedom that privately owned companies have.

1.4 RESEARCH OBJECTIVE

This research is set to achieve the following objectives:

- a. To examine whether the CAA is functioning efficiently.
- b. To identify the existing problems in the functioning of CAA.
- c. To evaluate the existing price structure concerning aeronautical revenue.
- d. To find out the viability of privatizing the CAA and it's future financial impact.

1.5 SCOPE OF THE RESEARCH

The research is limited to the Bahrain CAA financial performance, examining the CAA performance, existing pricing structure of aeronautical revenue (landing and parking, overflying and passenger departure tax revenue), profit and loss accounts and balance sheets, in order to predict the future profit and loss account, balance sheet and cash flow.

1.6 SIGNIFICANCE OF THE RESEARCH

The results of the research are expected to be significant for the new CAA Authority in the following respects:

- a. The research delineates the pros and cons of privatizing Bahrain CAA.
- b. The research enables the policy makers to evolve a suitable pricing policy.
- c. The research represents the first attempt to evaluate the Bahrain CAA financial performance.
- d. The research will help the CAA authorities/Government, with respect to methods of privatizing CAA, means to increase efficiency, ways to improve the quality of services etc., and ways to improve CAA revenues.

1.7 LIMITATION OF THE RESEARCH

The airport is affected by a large number of complex variables. The main limitations which the research encountered are:

- a. Non-availability of 1999 audited balance sheet. Hence, we used 1998 as the base year to analyze the airport efficiency.
- b. Non-availability of data pertaining to fixed and variable costs incurred on different aircraft, according to size (length X wingspan) and Maximum Take Off Weight (MTOW).

- c. The fact that there is only one airport in Bahrain, is the serious handicap for considering privatization.
- d. Non-availability of a comparative study between a privatized and public owned airports.

Yet, the findings obtained are still useful and help to achieve the main purpose of the research.

1.8 ORGANIZATION OF THE RESEARCH

The research is organized into five chapters:

Chapter 1: Introduction

This introductory chapter aims to provide the reader with the introduction to the airport and the functioning areas, the statement of the problem, purpose, scope, limitations and organization of the study.

Chapter 2: Literature Review

The aims of the chapter are to discuss the literature on privatization, airport privatization, price cap formula, airport price structure and Bahrain CAA.

Chapter 3: Research Methodology

This chapter discusses data gathering methods, data analysis techniques such as Destination Quality Matrix (DQM), Weighted Average Cost of Capital (WACC), Net Present Value (NPV), Cash Flow (CF), Internal Rate of Return (IRR), sensitivity analysis, simple regression analysis and iteration technique: The main sources of data in this research is secondary and primary.

Chapter 4: Analysis and findings

The aim of the chapter is to present the findings and the analysis of the work. Data will be analyzed using the techniques mentioned in the methodology chapter. The research findings will be related to the concepts and standards in the literature (chapter 2).

Chapter 5: Conclusions and Recommendations

In this chapter conclusions and recommendations will be drawn, and recommendations will be made on the basis of the conclusions that have been found from the data analysis and findings.

CHAPTER 2

LITERATURE REVIEW

2.1 PRIVATIZATION

2.1.1 Introduction

Privatization is the sale of government assets to private owners, or the provision of government services by private companies. But it is more than that, as the process involves all levels of State responsibilities. This activity must be in accordance with quality criteria and development objectives and provide tools to restructure the relationship between the public and private sector. The concept of privatization began in the early 1980's and the term "privatization" has become a common term in the economic and political spheres. Privatization, as a transfer of assets or functions from the State to the private sector, is to be accompanied by a radical reallocation of available productive resources, a restructuring of the institutional setting in which production and services takes place, and the introduction of new methods of corporate governance, freed from strong political intervention or control.

A major aim of privatization has been to increase efficiency in the economy while improving economic growth and development through the removal of unprofitable enterprises and functions from a government's budget.

Privatization in all its forms began in the 1980's. In Britain, more than 16 major publicly run companies, which account for 40% of Britain's state sector, were either wholly or partly privatized. The process of transferring public enterprises to private ownership began more slowly in developing countries such as Turkey, Chile, Togo, Mexico, Bangladesh and Malaysia. For developing countries, privatization was linked with macroeconomic burdens of the public enterprise sector, (D'Souza, 1998).

Financial support for public enterprises, reduced the funds available for social services. In addition to that, by the late 1970's, public enterprises accounted for one-third of all international borrowing by developing countries, (Kapur, 1995).

In early 1990, Panama, Argentina and Brazil started privatization programs.

Arab-British Chamber of Commerce 1990 stated that privatization is also taking place in the US. The United States Postal Services opened up competition and encouraged public/private joint ventures of infrastructure,

including schools, roads and bridges, although many local government services have been contracted out to private business.

This chapter is going to present the first section which covers the overall overview of the privatization processes, factors and objectives. The second section is going to look at the basic methods of privatization around the world. The third section is going to cover privatization as a management tool. The fourth section is going to cover the processes of implementing a privatization program and the last section is the summary.

2.1.2 Factors which make privatization attractive

- a. High economic growth and improved economic performance in Japan, Asia and Latin America due to the intensive competition in the private sector.
- b. The emerging “fourth industrial revolution” is driven by information technology. The rapid change in the market, which needs continuous development and research, results in an impossibility for many firms to remain under the control of the state, where decisions are to be taken and response to the market is slow.

- c. The monopoly status of the government has resulted in inefficiency and lack of competitiveness, due to poor financial performance, highly centralized organization, lower productivity, dependence on subsidies, exclusion of competitive imports, and corrupt practices as well as being vehicles for the flight of capital.

2.1.3 What has been happening in privatization

Privatization, economic liberalization and restructuring are embarked on, in many countries, today, including the Arab States.

The Arab-British Chamber of Commerce publication in 1990, has stipulated that Hungary will retain 51% share in privatized assets and that shareholdings by foreigners will be restricted to 15-20% of total assets sales.

According to Kapur (1995), in industrialized countries such as the U.K, Canada, France, Spain and Italy, privatization sales amounted to \$36.8 billion in 1988, which represented 94% of worldwide transactions. In 1992 industrialized countries shares in worldwide privatization fell to 58% of the worldwide figure, excluding over 11,000 privatization which occurred in former East Germany between (1990-1992).

The developing countries share of world privatization sales reached 6% in 1988 and rose to 42% in 1992. The highest increase was in South American economies which increased from 6% in 1988 to 33% in 1992.

2.1.4 Why have Government Own Enterprises (GOE) been created?

Many developing countries have created GOE for the following reasons:

- a. *Adding economic development:* Government invests in areas which the private sector is unable to invest in due to their returns being low, and risks being high or because the capital requirement is too high for the private sector. Example areas such as airlines, mining and steel production.
- b. *Rescuing Failing Private Enterprises:* GOE is sometimes created in order to rescue failing private sector enterprises. When a private business is losing money, there is a possibility that this may result in job losses.
- c. *Enhancing Political or Economic Control:* GOE may be used to expand political and economic control, as a government's priority is to put community interest at the top of the agenda. On the other hand, governments do not want to divert enterprise revenue to the private sector because government law wants enterprise revenue to be used for capital and operating costs.

2.1.5 Criticism of privatization

D'Souza (1998) stated that privatization may lead to the loss of certain jobs and reduced salaries, and there may be less concern for safety. On the other hand, as private sector aims are to reduce costs and increase profits to declare good dividends for shareholders, it could result in consumers having to pay higher prices for reduced services. Therefore, there will be winners, and losers in privatization.

2.1.6 Barriers to privatization

Privatization is facing two kinds of barriers at both policy and administration levels.

a. Policy level barriers

- a.1 *Political and Ideological barriers:* Public enterprises are the strength and the power of the government authority i.e. ministries. Any transfer of public enterprise to the private sector will face a strong resistance from the government authority (D'Souza, 1998).
- a.2 *Economic barriers:* Kapur (1995) argued that some enterprises when run by government, are more efficient, i.e. the state oil-company in Venezuela is widely recognized as being among the best-run enterprises in the country.

- a.3 *Social barriers:* Some public activities or assets, which are for social benefit, are prevented by government from being privatized i.e. the U.S., Congress prevented the sale of NASA's weather satellite and public lands such as parks or recreation areas.

b. Administrative barriers

- b.1 *Buyer willingness:* Private sector buyers are interested in a high return on their capital investment, while government enterprises are interested in selling enterprises with great losses that the private sector is able to buy only when the price is low.
- b.2 *Buyer capacity:* The financial position of the private sector may be inadequate to buy public enterprises.
- b.3 *Administration mechanism:* Selling an enterprise is administratively complex. Many problems may arise, especially in developing countries, such as the difficulty of assessing the value of the company due to lack of capital market, investors and valuation specialists.

2.1.7 Objectives of Privatization

- a. Allows government to get out of a business, to strengthen private market forces and competition, while encouraging private sector and corporations to own production units to expand private sector ownership of productive assets in the society, and also to shift greater performance and financial risk to the private sector. On the other hand, it will create a more entrepreneurial environment that will respond to any changes in market opportunities.
- b. Latin American and Caribbean Privatization Network (1998) disclosed that privatization generates new sources of liquidity and financing for enterprises, such as increased domestic investment, return of flight capital, foreign direct investment and promote external lending.
- c. Reduces the government's fiscal deficit, cost of doing business and its external and internal debt.
- d. Improves quality, increase productivity and labour, cost saving, easy access to money markets for investment capital, image/culture improvement and increase domestic and international business confidence.
- e. Mobilizes huge flows of national and foreign capital, transform business and financial structures, change patterns of internal and external competition.

- f. Economic restructuring.
- g. Increase the gross national product and stimulate economic growth through boosting exports, reducing imports and bridging the balance of payment deficits.
- h. Providing an opportunity for governments to re-invest privatization proceeds in enterprises for which the private sector are unwilling to invest in. i.e. enterprises which speed economic and social growth.

2.1.8 Basic Methods of Privatization

Latin American and Caribbean Privatization network (1998) presented the most commonly used methods of privatization as follows:

- a. Public offering of shares.
- b. Private sale of shares.
- c. New private investment in a State Owned Enterprise (SOE).
- d. Sale or transfer of government or SOE assets.
- e. Reorganization (or break-up) into component parts.
- f. Management/employee buyout.
- g. Lease and management contract.
- h. Full liquidation of a SOE with the assets ending up in the hands of private purchasers.
- i. Substitution of state or government production to the private contractors or services, with management and operating contractors

subcontracting out specific tasks for services previously provided by government employees or management and operating contractors.

- j. State issued revenue participation certificates or revenue bonds or shares. This is mostly use in airport privatization.
- k. Privatization by “attrition”. The state permits the private sector to invest in plants and related facilities/functions and then take overall or part of the state operation.
- l. Increased use of private sector financing of new activities.
- m. Economic policy reforms, such as demonopolizing certain activities or liberalization or reducing regulatory constraints.

2.1.9 Privatization as a Management Tool

The Vice President Gore Reinventing Government Initiative (1999) stated that privatization serves two primary purposes as a management tool. First, at a strategic level, it helps an organization focus on those work activities that represent its core expertise, skill, or value-added offering. Second, at a tactical level, privatization is a means of reducing costs by ensuring that work activities are performed by the most productive, cost-effective means.

For government activities, application of privatization as a management tool, requires active and continual examination of functions to determine

whether they are necessary and, if so, whether they are more appropriately or more effectively performed by private parties, at some level of the activity. As with any private organization, the government must differentiate between “core” or “inherent” governmental activities and those that are appropriate subjects for private performance.

Privatization is not a cure-all for every management problem. When pursued purely for its own sake or otherwise misapplied, privatization can significantly impair management efficiency and effectiveness.

Privatization is not suitable for many situations where core missions, inherently governmental functions, or other essential requirements dictate the retention of a more traditional government role, and in cases where functions are more cost-effectively provided by in-house personnel. Successful privatization requires careful analysis of opportunities and painstaking attention to process details. From the above we conclude that *(Privatization is a management tool, not a substitute for management)*.

2.1.10 Implementation of Privatization Processes

When preparing a state enterprise for sale it is necessary to consider the following before implementing the privatization:

- a. Make changes within the organization and adapt management practices to fit with the privatization requirements.
- b. Apply sound accounting principle.

- c. Clear up all enterprise liabilities.
- d. Deal directly and quickly with excess labour.
- e. Avoid new investments.

However, it is important to determine the sale price of the enterprise through competitive bidding procedure. Evaluation of the state enterprise assets is difficult in developing countries, due to insufficient financial data, unacceptable commercial standards and continuous change in macroeconomic environment. This was argued by (Latin American and Caribbean Privatization Network, 1998).

On the government evaluation part, the government sometimes overvalues assets because they depend on the historical book value. In some cases they underevaluate their assets when book values are not adjusted for inflation.

Overpricing shares in a public offering is another failure of implementing privatization, because when share price is low, it will result in increasing demand, full subscription and dilution of ownership.

To offset potential and financial costs, some countries offer discounts to small investors and ask higher prices from institutional investors. Governments started with smaller share offerings and higher discounts. Over time, as commitment is demonstrated and private sector confidence

is increased, larger percentages are offered, and discounts reduced (Kapur, 1995).

2.1.11 Summary

- a. Government must be clear about the objectives of the privatization, i.e. either to increase productivity, or to be more efficient in organization, or to attract foreign investment, create entrepreneurial environment, or reduce cost and maximize sale price, or increase competition, or improve equality, or reduce the fiscal deficit, or increase the size of their local stock exchange, or a combination of any of the above.
- b. In order to improve a country's economic position, it may be necessary to increase the efficiency of a public sector organization. This will only happen if large privatization is accompanied by extensive industrial restructuring.
- c. Privatization requires some change in accounting practice, disclosure of financial and nonfinancial information, valuation of assets and liabilities, translation techniques and performance evaluation.
- d. If privatization is to be implemented effectively, it important to have a good economic environment, especially from the

macroeconomic point of view, with an open market policy, no subsidies, liberalization in all sectors of the economy, good financial climate, stable currency, appropriate laws for investments and an economic growth.

- e. Privatization requires a new way of doing business. The private sector must develop new ways of thinking and new skills, to successfully develop and manage privatization initiatives. This new thinking must challenge traditional ways of doing business in certain activities.

2.2 AIRPORT PRIVATIZATION

2.2.1 Introduction

The airport sector is now regarded as a dynamic, commercially oriented industry, which becomes a major employer in many communities and directly affects many airlines and passengers every day. Airports are operated by a combination of private, semi-private and government owned bodies. Even an airport which is wholly government owned or privatized, is being run as a competitive business which is motivated by profit. Therefore, they concentrate on a more efficient framework in order to be a profitable enterprise.

Privatization is the return of business to private ownership, after they have been the property of the state.

The concept of airport privatization is to reduce the government's involvement in providing services by injecting private sector capital and an ethos of business efficiency into airport management.

2.2.2 Airport privatization attractiveness

2.2.2.1 Several factors have combine to make airport privatization attractive

- a. The view now is that government is not always the most efficient provider of public services and also they are under pressure to reduce spending, both in terms of capital expenditure and recurring subsidies for public utilities.
- b. ACI (1998) argued that airports have strong growth profiles, often at twice the rate of gross national product, due to the increase in traffic world wide up to year 2010. The International Civil Aviation Organization (ICAO) predicted that USD 350 billion in additional airport infrastructure is needed in order meet the demand of travel. Therefore, privatization is offering innovative ways of injecting the private sectors with capital to finance airport development projects. On the other hand, private sector is more responsive to the change in the market opportunities, which in the end, create a more entrepreneurial environment and corporate culture.
- c. If the financial position of the airport is bright, the investor will invest in such an airport without hesitation, i.e. the recent sale of 17 of Australia's airports, where the sale price far exceeded the expectation of the government.

d. They have a favorable industrial structure due to the following reasons:

d.1 Barriers to entry are high, reducing the threat of new competitors breaking into the market and economic factors put a potential entrant at a disadvantage. There are several types of entry barriers :

d.1.1 *Inability to gain access to specialized know-how:*

Many airports need skills not readily available to newcomers. They may face a lack of technically skilled personnel as existing airport management often carefully guard know-how that will give them an edge over other competitor airports.

d.1.2 *The existence of learning and experience curve effects:*

Result of experience in providing certain services and other learning curve benefits will lead to lower unit costs. New competitors face a cost disadvantage competing with existing airport management with more know-how.

d.1.3 *Resource requirements:* The larger the capital and other resource requirements, the more limited the number of potential entrants. The capital requirements are associated with equipment, working capital to finance inventories, introductory advertising and sales promotion. On the other side, resource requirements include access to technology, specialized expertise and know-how, R&D requirement, labor force requirement and customer services requirements.

d.1.4 *Cost disadvantages independent of size:* Existing airports may have advantages not available to potential entrants. For example the benefits of learning and experience curve effects, favorable locations and lower borrowing costs.

d.1.5 *Regulatory policies:* Government regulation and policy can limit the newcomer by imposing certain rules, regulations and trade restrictions which make the entrance process very sophisticated.

- d.2 Competitive pressures from substitutes is relatively low for most airports because customers are going to pay higher costs when switching to a substitute airports. Substituting to other airports can only be attractive for major hubbing activity.
- d.3 Number of airport facility suppliers are high, which is going to encourage competition and reduce costs. Also the bargaining power of the supplier is low because they are supplying standard items, which are available in the open market from a large number of suppliers, with ample capability.

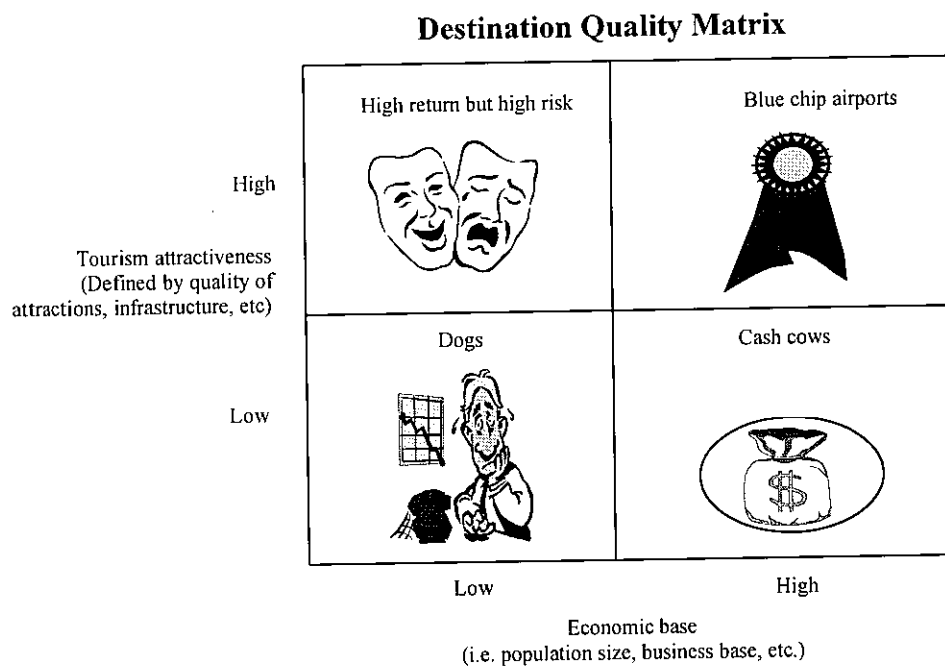
2.2.2.2 Destination Quality Matrix Analysis

Ivo Favotto, a partner of a Sydney – based strategy and organizational capability development consultancy, developed the DQM to measure airport attractiveness. Seventeen airports in Australia used DQM analysis before deciding to transfer airports ownership from government to the private sector.

While airports are attractive businesses, they are not created equally. Some airports are more profitable than others. Therefore, investors and financial markets must assess the attractiveness of airports before any

by using the destination quality matrix DQM. DQM is a function of two factors: its tourism attractiveness and the size of its economic base.

FIGURE 2.1



Favotto (1998) stated that he “blue chips” serve destinations with high tourism attractiveness and have strong economic bases. High tourism attractiveness will result in high traffic growth, which will result in increased revenue, as a result of a strong economic base. Therefore, the revenue streams of these airports will generally be classified as low risk.

Cash cows are the next most attractive type of airports to invest in. These have a strong economic bases but low tourism attractiveness. They also have a stable income stream because traffic flow depends on visiting friends and relatives. These airports will rarely let investors down in the long term.

“High risk high return” airports are fairly risky airports, for which tourism attractiveness is high due to high traffic growth but they have a weak economic base, unless it is a hub, then they will attract more investors.

The least attractive airport is “Dogs” with low tourism attractiveness and a low economic base which is generally avoided by investors, unless they can be picked up at bargain prices. Recently 50% of world-wide airports fell into this category, and were making losses.

2.2.3 Various forms of airport privatization

The following privatization forms are extracted from the (ACI up date no.6 1998):

- a. *Perpetual franchise*: under which ownership, financing and operation are permanent responsibilities of the private firm developing the airport. The government regulates safety, the quality of service and sometimes prices or profits.
- b. *Buy-Build-Operate (BBO)*: a system whereby a private firm buys an existing airport from the government, and expands or improves it as a private facility. Underdeveloped, deteriorating or congested facilities are often ripe for this model.
- c. *Build-Operate-Transfer (BOT)*: which is probably the most common model used to date. The private company receives a franchise to finance, build or modernize a specific facility and operate the

facility over a long period of up to 50 years. At the end of the period, the facility is returned to the government. The private sector assumes all commercial risks under the concession. BOTs are used for infrastructure development and in airport privatization.

Due to its attractiveness, this form of privatization is underway in 17 countries, mainly in Eastern Europe, the former Soviet Union, Latin America, Asia and the Caribbean. The benefit of this airport privatization method is providing access to private capital markets, transfers of project risk to the private sector. It also enables the project to benefit from the skills and experiences that may not be available in the host country.

With a long term concession, the private firm has the responsibility to finance, build, and operate the facility for a specified period after which the ownership reverts to the government at a notional cost. In return, the private firm may collect revenue from the facility, which is used to cover accounting, capital and concessionaire costs.

A BOT scheme example is El Dorado Airport in Bogota, Colombia. In 1994, the CAA of Colombia launched an international bidding process for the development and maintenance of a second runway. The project funding of around US\$ 100 million will be provided through a 20 years concession as the private sector operator will

collect revenue from landing fees. Also the private operator will also receive a 20% equity stake in the facility.

In Australia, there is an option for renewal of the franchise for a further period of 49 years.

- d. *Build-Own-Operate-Transfer (BOOT)*: BOOT projects are similar to BOT, except that the private firm takes over ownership of the facility during construction. BOOT schemes are used when loan guarantees are required. The new airport in Athens, Greece and Terminal 3 in Toronto are examples of a BOOT.
- e. *Build-Transfer-Operate (BTO)*: under this method the private firm designs, finances and builds the facility, but transfer ownership back immediately after construction. The private firm then leases the facility from the government and collects revenues over a long lease period. In real estate parlance, this is known as sale and lease-back, a system which is often used for its tax advantages.
- f. *Wraparound Addition*: whereby an existing government-owned facility is expanded by a private firm. At an airport, this could include private ownership of a facility such as a terminal or a parking garage. This results in effective joint government-private sector ownership of the airport. Also this scheme is used when existing passenger terminal areas need to be expanded through private sector participation.

Also this type of airport privatization allows carriers to vertically integrate operations, specially at airport hubs, i.e. British Airways at Birmingham International Airport.

g. *Lease-Develop-Operate (LDO)*: under which a private firm leases, an existing facility and then develops it under a revenue-sharing contract with the government, over a long period, with the government retaining ownership. The private firm upgrades and expands the facility and manages cash flows. Examples of LDO include Atlantic City, New Jersey and Venezuela.

h. *Full or partial share flotation's*: one example is the full privatization of the British Airports Authority (BAA) in 1987, with a 100 % offering on the London Stock Exchange. Example of partial flotation's are the Austrian Government's flotation of 27 % stake in Vienna Airport in 1992 and another 22% in 1995. Similarly, the Danish Government floated 25 % of Copenhagen Airport in 1993 and a further 24% in 1995. In a variation of this approach, all shares in Belfast International Airport were sold to management and employees in 1993.

- i. *Management contracts*: the management of all or part of the airport is contracted by the airport authority to a specialized operator, for a specific period of time, under specific conditions: economic incentives, maintenance, performance criteria and infrastructure commitments. This type of airport privatization takes different forms depending on the day to-day operations, services managed and economic incentives.

BAA management of the retail concession at Pittsburgh, Vancouver's operation of Bermuda airport and AGI's running of the international terminal at Atlanta Hartsfield are just a few of the many examples of airports being managed by other airports or by other firms in the transport sector. Such contracts are often accompanied by the management firm taking an equity stake in the enterprise.

- j. *Joint ventures*: which are another widely-used vehicle for the privatization of airports over the past two years. In the case of the Australian privatization, these usually took the form of an airport or firm experienced in airport management taking a minority equity interest and long-term management contract, with local or international financial institution taking the majority equity stake. Another common form of joint venture is an airport and a construction or engineering company, sometimes in alliance with financial institution, joining forces to build and manage a new airport or upgrade an existing airport.

For example, Odgen Aviation and SEA (Milan Airports) teamed up to make the winning bid for a 30-year concession on Argentina's 33 airports. Similarly, the German engineering/construction firm Hochtief and Aer Rianta-Irish Airports joined forces to take a controlling interest in Dusseldorf Airport.

For a public/private joint venture is the Kansai International Airport which amounted to a USD 20 billion package of which government hold two-thirds of shares and the remaining were divided among twelve local governments and 803 private companies and individuals.

On the other hand, the United States considered airports to be a solid investment. Federal Aviation Administration (FAA) exempts airport revenue bonds from taxation and recently they want to bring private equity capital into airports and have targeted five airports, including one large hub, for privatization over the next few years as a pilot project (Testimony, 1996).

In South America, Colombia's EL Dorado Airport in Bogota (CODAD), mobilized private funds to develop an airside as construction of the second runway. Ogden Aviation, as construction manager and partner awarded the contract of USD 145 million to build the 3800-meter runway. CODAD is 100% owner of the new facility and will collect revenue from landing fees over a period of 20 years.

While the Colombia Civil Aviation Authority will continue to provide air traffic control services on the one hand, the contractor is responsible for the maintenance of the runway as well as the existing runway.

2.2.4 Key issues in airport privatization

- a. It is common knowledge that privatization can bring greater profitability by achieving operational efficiency and responding quickly to market opportunities. However, this does not mean that government-owned airports are inefficient, as many airports achieve reasonable profit when they are under government control.
- b. Some privatized airports may be involved in businesses which are unrelated to aviation, such as investments in malls or retail concessions. One forecaster analyzed 82 commercial airports and showed that only 20% of these airports, total revenue is derived from landing fees, while over 40% of total revenue is derived from concessions and parking fees, 20% from terminal leases and 20% from other sources. Individual airports can set their own economic policies according to their own financial self-sufficiency. In other examples, some airports have introduced peak charges during peak period and this accepted by ICAO.

2.2.5 Some key awareness of airport privatization

- a. Some airports in foreign countries face the absence of core staff which limits them to exporting their management philosophy and prevents the corporate culture indefinitely.
- b. Possibility of fewer passenger (mainly frequent fliers) only recognizing the new brand airports, which brands usually work best on homogeneous products or services and airports which do not fit that profile. For example putting the BAA logo on Melbourne International Airport might remind only a few passengers that BAA has an excellent record of productivity. On the other hand, if the airports logo is known worldwide, and one airport in the system fails to provide a high quality service, then this may be harmful to other airports which carry the same logo.
- c. Privatized airports must apply non-discrimination between categories of users because airport, as business enterprises must earn a reasonable rate of return on their investment.
- d. The national authority may interface in choosing the type of airport ownership as airports play an important roll in the economy. This might effect their operation and growth.
- e. A privatization characteristic is to open up entrepreneurial sources of capital to finance airport development.

- f. On the downside, it is risky for the private owner to adopt the short term mentality of looking for an immediate profit and declaring good dividends for shareholders. This could result in ignoring re-investment of profit for infrastructure development.
- g. Government responsibility is to put community interest as a top priority on the agenda, while the private sector may cutback in expansion programs, which could result in a reluctance to invest in major infrastructure projects, which could have the effect of constraining projects.
- h. National and regional authorities should be involved in the earliest stage of developing new regulations for privatization of a new airport, i.e. a wide range of regulations are beginning to emerge in this respect, particularly in the Middle East, Australia, Austria, Canada, New Zealand and United Kingdom.

ACI favors a regulatory regime which gives maximum operational flexibility to the airport operator.

- i. The private owner may increase or decrease airport charges (landing, parking, aeronautical, handling charges) depending on market forces. BAA reduced aeronautical charges due to the very high land side revenue (landing, parking and handling charges) because United Kingdom is considered the hub of Europe. However, there are some

cases in which aeronautical charges have been increased after privatization.

Airlines and other parties do not want to bear the additional cost they may pay, specially when there is just one international airport.

- j. In some countries, where airport privatization has been approved by the state authority, there may still be considerable legal and administration constraints which should be overcome.

2.2.6 Summary

Airport privatization is the transformation of an airport from what was previously a government run airport to a commercially oriented corporation.

ICAO predicted that air travel is going to double over the next 15 years. In 1998 world airports handled 3 billion arrival and departure passengers. However, ICAO forecasts suggest that air travel will continue to grow at 5% a year. This means that airports will have to handle 5 billion passengers a year which is equivalent to 90% of the existing world population. The ICAO forecasts that \$ 500 billion will be needed for airport expansion in order to meet additional passenger flow, and airports are completely dependent on government funds for airport development. These funds are expected to decline in the long run as government spend on improving macroeconomics fundamentals and social-ills.

Therefore, airport privatization will need to provide adequate funds for airport infrastructure improvement, provide first class airport management services and transfer responsibility of the system to a for-profit corporation.

2.3 MONITORING AIRPORT PERFORMANCE AND EFFICIENCY

2.3.1 Introduction

Every business and organization, whether public or private sector is required to measure and monitor their performance for several reasons.

First performance indicator is to measure an airport's economic efficiency, to determine the relationship between airport inputs (labour, capital, etc) and its outputs (total revenue, Work Load Unit (WLU), passenger, air transport movement, etc). This performance indicator should be used to ensure that the airport management is making the best utilization of the resources. In this instance separately measuring airport profit does not provide a proper incentive to improve efficiency and overall performance.

Second performance indicator is conducted for airport planning and investment decision making, in order to find out what is the input required to give a certain output.

As argued by Doganis (1994), prior to BAA in 1980 the government had set up the following main performance targets for the financial years 1983, 1984, 1985 and 1986:

- a. To achieve on average a minimum annual rate of return on average net assets of 3% plus one-fifth of the annual percentage growth in airport passenger per year.
- b. To reduce costs (at constant prices and excluding depreciation) per airport passenger by one half per cent a year plus an additional reduction equivalent to two-fifths of the percentage growth in airport passengers over the three year period.
- c. To increase the number of airport passengers per payroll "hour" by 0.5% a year plus two-fifths of the percentage growth in terminal passenger over the three-years period.¹

Performance indicator used as a management tools to analyze and monitor past and present performance which enable airport managers to ensures that the various inputs and resources employed at the airport are used efficiency and effectively.

Therefore, managers can decide what levels of performance are needed to meet corporate and other investment objectives and set budgets or targets which incorporate the relevant performance indicators.

¹ (Payroll hours are total number of hours worked by employees including overtime and the hours of part-time employee).

There are two ways of assessing performance internally, either to compare airport performance over time or to compare its actual result to planned or forecasted performance. There are two kinds of performance indicators. First, there are straightforward measures of output i.e. total passengers handled, total profit generated or number of employee. Second, measures of input-output ratio, which measure the output generated by a given level of inputs.

2.3.2 Measuring Airport Outputs and Inputs Performance

Ann Graham, Senior Lecturer at the University of Westminster developed methodology for measuring airport performance which falls into the discrete area of airport performance:

- a. Overall cost performance.
- b. Labour productivity.
- c. Revenue generating performance
- d. Performance of commercial activities and
- e. Overall profitability.

Cost performance analysis, in general, is to examine the following measurements:

- a. Total cost per WLU (after depreciation).
- b. Operating cost per WLU (excluding depreciation).
- c. Labor costs per WLU.

- d. Labor costs as percentage of total costs.
- e. Aeronautical costs per WLU.

Labor and capital are the two major input costs for airports. The following indicators can be used for monitoring labor productivity in addition to labor costs per WLU:

- a. WLU per employee.
- b. Total revenue per employee.

Revenue can be generated from aeronautical or non aeronautical services. The total revenue levels are effected by many factors e.g. UK government in privatizing BAA imposed formula $(RPI - X)$, which limited the BAA maximum annual increase on airport aeronautical revenue, where RPI was the increase in revenue in retail price index and X an efficiency factor which allowed economy of scale in airport operation. Other factors include, whether the airports themselves undertake functions such as handling or operation of duty free shops, which is normally provided by others. Revenue analysis is going to measure three revenue performances:

- a. Total revenue per WLU.
- b. Aeronautical revenue per WLU.
- c. Non – aeronautical revenue per WLU.

On the other hand, the reasons for monitoring the non-aeronautical area is first, airports are trying to generate an additional increase on total revenue from commercial activities. Second, because concession and rental revenues are more under the control of airport management than aeronautical revenue, they may be controlled by governments or level of traffic. Therefore, the airport manager has greater scope to improve performance in the commercial areas than the aeronautical resources.

Commercial activities performance is divided into the following:

- a. Concession plus rental income per passenger.
- b. Concession revenue per passenger.
- c. Rent income per passenger.

Finally, profitability performance is going to measure profit/deficit per WLU, which relates airport profit to the traffic. It will show how much profit is generated from each unit of output, which is going to indicate the profit margin in terms of the difference between total unit costs and unit revenues expressed as per unit of output, that is work load unit.

This will depend on the revenue to expenditure ratio as this ratio is total revenue to total cost.

Expressed in percentage terms, a figure above 100% indicates profitability, for example, a ratio of 1.02 (or a percentage of 102) would indicate that revenue exceeds cost by 1 percent, 100% is break – even and

and below 100% is a loss. This measure reflects how successful the airport has been in covering its costs.

2.3.3 Summary

Performance indicators seek to define the relationship between inputs and outputs. The inputs can be measured in financial terms (i.e. labour cost, capital cost) or physical terms (i.e. staff number, productive capacity). Similarly outputs can be measured in both financial terms (i.e. revenue) and physical terms (i.e. goods/services).

Therefore, performance indicators are very useful to an airport manager for internal monitoring and future planning and investment decisions. Also, it can be used to investigate whether privatized airports are more efficiency run than public airports.

2.4 PRICE CAP FORMULA

2.4.1 Introduction

Rigas Doganis, Professor of Air Transport at Grandfield Institute of Technology developed a Price Cap Formula to measure the increase or decrease in aeronautical charges for landing and passenger fees. This formula allowed rising the charges for five years by an amount equivalent to no more than the increase in the retail price index or consumer price index. In other words, average increase had to be a little below the rate of inflation. This is known as the Retail Price Index – X ($RPI - X$) or Consumer Price Index – X ($CPI - X$). “X” is an efficiency factor that allows that there are economies of scale in airport operations. Therefore, the cost of handling each passenger goes down as traffic increase (Doganis, 1997).

2.4.2 CPI – X Formula

As many privatized companies are now private monopolies, they would be expected to conform to profit maximization principle.

Each firm must limit its product price rises to “X” percentage points less than the rate of inflation. If the regulator reckons that a firm is earning too much monopoly profit, it can raise “X”. To get public sector managers to agree to be privatized, and to persuade investors to buy the

shares, managers are encouraged to believe that they will be able to raise their prices to cover the costs of almost any investment.

CPI – X can work if the regulator has an idea of how efficient the firm is, and how much better it could be.

2.4.3 Working of Price Cap Formula in the Case of Airport

The CPI – X formula is used widely by the privatized BAA. It helps to achieve an adequate rate of return. That is, it takes into account reasonable operating costs and capital investment. This formula is used only for public utilities. The price cap refers to revenue yield per passenger from aeronautical services.

In the case of airports, changes in aeronautical charges in terms of changes in inflation, is measured by (CPI – X). “X” in the formula denotes an efficiency factor which allows for the fact that there are economies of scale in the airport operations. Therefore, the cost of handling each passenger goes down as traffic increases. Doganis (1997), stated that there are three variables taken in to account to calculate “X”.

They are as follows:

- a. Projected growth in traffic, which can generate more aeronautical revenues and reduce cost per passenger.

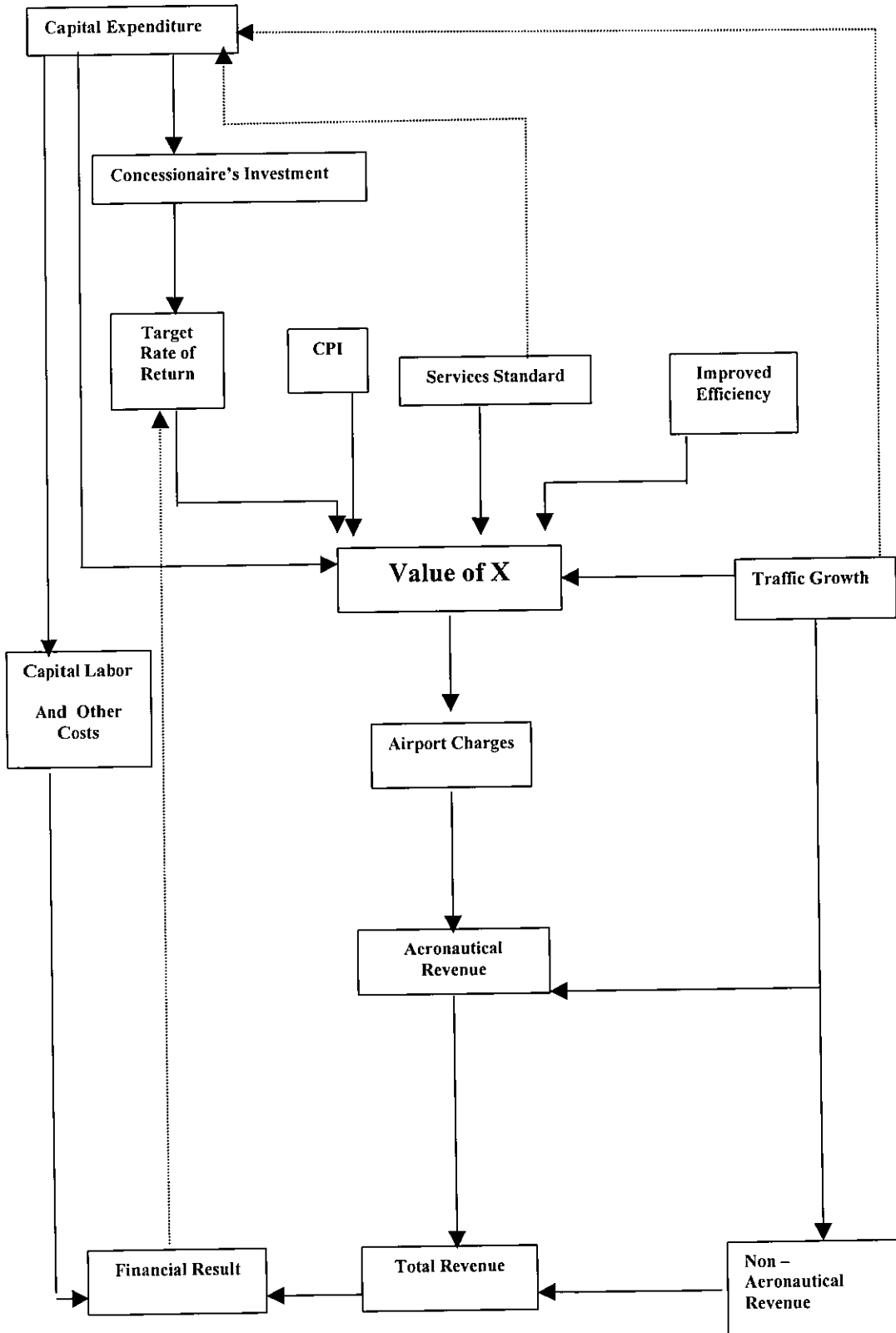
- b. Level of capital investment in aeronautical services, deemed necessary by the airport operators to maintain agreed service standards and efficiency.
- c. Acceptable target rate of return on net assets for running any business during the period. Figure 2.2 explains the inputs used in calculating “X” in Price-Cap Formula.

The relevant charges covered by the formula are:

- a. Aircraft landing and parking charges.
- b. Air bridge charges.
- c. Passenger charges.

FIGURE 2.2

Price Cap Formula CPI – X Model



NOTE: _____ direct relationship in calculating X
 ----- indirect relationship in calculating X

The price cap formula does not apply to individual aeronautical tariffs, but to the average aeronautical revenue per passenger. This is known as the revenue yield. The X in the formula allows for major investments and it ensures that the airport operator achieves an adequate rate of return for the assets used.

2.4.4 “X” in operation

In Britain, besides airports, several other sectors employ the price cap formula. The UK government, in privatizing the BAA imposed this formula, which limited the BAA's maximum annual increase on airport aeronautical charges. In 1987, when the airport was privatized, this formula was expressed as $(RPI - X) + S$ where RPI was the increase in the Retail Price Index and S was a figure to cover the increase in security costs. After five years it was revised as $RPI - 8\%$ since the RPI in these two years was around 3-4%, the charges had to be reduced. In January 1996 the UK Monopolies and Merger Commission recommended that Heathrow and Gatwick airport charges, in each of five years starting on 1st April 1997, should be fixed at the level which is equivalent to $RPI - 3\%$, which would enable BAA to achieve a return on its assets of 8.6% over the five year period.

The formula has been applied in many privatized airports. When Melbourne Airport was privatized it was $\text{CPI} - 4\%$, in Brisbane it was $\text{CPI} - 4.5\%$ and in Perth it was $\text{CPI} - 5.5\%$.

Yet another aspect of the formula is that once the airport is privatized, the newly fixed aeronautical charges/prices can be revised only after five years.

2.4.5 Advantages of “X”

- a. Doganis (1997) argued that “X” generates a reduction in airport charges as a result of efficiency improvements and focuses on maximizing commercial and other non aeronautical revenues.
- b. It is generally accepted by airlines.
- c. It provides scope for airport charges to be increased if major new investments are necessary and supported by airport users.
- d. If the price control established through the $\text{CPI} - X$ formula is for a five years period, it minimizes the cost of regulation both for the Airports Regulating Agency and the airport regulator.

2.4.6 Summary

Most governments have at some time controlled the level and structure of airport charges specially, if they owned the airports. Privatization requires the regulation of tariffs to be explicit, rational and transparent. The policy established should be long-term. If this condition does not apply, the value of the airport being privatized will be adversely affected.

The private company is required to recommend the level of increase or decrease of aeronautical charges, that could be levied during a five year period by adapting a price cap formula, which stipulates the acceptable level of change in the aeronautical charges, in terms of formula related to the change in inflation as measured by the RPI or CPI. This is known as RPI minus "X" formula where "X" is an efficiency factor which allows for the fact that there are economies of scale in airport operation. The value of "X" is calculated to allow for major investments and at the same time to ensure that the airport operator can achieve an adequate rate of return on the assets used.

2.5 AIRPORT PRICE STRUCTURE

2.5.1 Introduction

A public-utility such as an airport is overloaded by social services considerations. During the last decade the governments of many countries asked the airport authorities to change this social services consideration and introduce commercial criteria. It implies the traditional average-cost pricing structure in relation to airport charges, needs to be altered.

The question of whether the existing price structure has to be abandoned altogether or there should be a change in the fundamental philosophy, has to be analyzed in accordance with the objectives of commercially oriented pricing policy.

Deganos (1994), presented in his book “ Airport Business” an application of cost-related pricing structure for airport operation and identifying the components of marginal cost, which is the direct cost of handling extra traffic units that are to be used as the basis of pricing at the short run marginal cost price (SRMC) and long run marginal cost price (LRMC). BAA adopted LRMC pricing for the southeastern airports in the early 1970's, to help to produce the best possible investment decision (Starkie and Thompson, 1985).

Until 1972 the charging system was based wholly on Maximum Take off Weight MTOW of aircraft. In 1987, when BAA privatized, such charges have been supplemented by a peak usage charge during the busiest summer hours.

The objectives of commercially oriented pricing policy are:

- a. To ensure efficiency in allocation and use of airport resources.
- b. To generate sufficient revenue to cover costs and generate profits.
- c. To provide a sound guide for future investments.

An efficient allocation of airport resources requires that the price paid by any user, reflects the costs which they impose on the airport. If prices reflect costs then two things follow: First, no one will purchase a particular airport service unless they value it at least as highly as the cost of producing it. Second, the risk of wrong investment or investment in particular airport facilities is reduced or eliminated. This is because if prices reflected cost then demand level will represent the true demand for that facility. Thus, it would provide an indication of whether additional units of that facility are needed at that price. On the other hand, if the prices are less than the cost, it may stimulate extra demand and this will induce investment in facilities which do not cover their full costs. This is the basic principle behind the commercial oriented pricing policy versus marginal cost pricing.

2.5.2 Traditional Price Structure

The suitability of traditional price structure to the current commercial environment, has to be examined in relation to the degree to which they reflect costs. The various costs we have to take in to account in this respect are:

- a. The costs incurred on the provision and maintenance of runways, taxiways and aprons. Generally airport charges based on aircraft weight reflect the cost of providing these facilities. This method is not just an indirect method, but also an inaccurate one. The reason is that the required strength of the runway, which determines its cost per square meter, is dependent not only on the weight of the aircraft but also on the configuration.

For instance, a large aircraft like a Boeing 747, has a landing gear which produces lower pressure on the runway than some aircraft which are smaller and lighter. Thus the Boeing 747 requires runways of lower strength and imposes lower maintenance costs than some smaller aircraft for which they must pay substantially higher landing fees.

The other important determination of runway costs is runway length. This, however, is only an indirect function of aircraft weight, since aircraft of the same weight may need different runway lengths for take off.

- b. The other airport cost is the cost incurred on the airport terminal and its associated facilities. This implies the weight of the aircraft and the required terminal facilities, are positively correlated. That is, the costs imposed by particular aircraft on the terminal facilities are less a function of aircraft weight than of the type of service being operated and the terminal facilities required. For instance a Boeing 747 may require a gate lounge and air bridge while certain aircraft may need no lounge and just stairs to the apron.

On the whole we, can summarize the disadvantages of traditional pricing structure as follows:

- a. There is no discrimination to aircraft manufactures which require short runways or long runways, of landing and parking area. They would not themselves benefit from any reduction in airport costs as a result of improvement of their manufacture.

In other words, when new aircraft types require capital investment by the airports to provide longer runways or to modify terminal buildings, these increased costs are met, not by the new users but are

shared among all users. This in fact, discourages airlines from introducing new aircraft.

- b. The present pricing structure in no way discourages the peak period users from using the costly facilities during the peak day. The average cost pricing structure in fact stimulates the demand for airport facilities at the peak periods and arrests the demand for off-peak facilities. It means airport are under pressure to provide additional runways or terminals as congestion builds up at peak periods. Thus there is no inducement for high density operators to move flights from peak to off-peak periods or to use fewer, larger aircraft during busy periods.
- c. The present pricing structure does not allow for the optimum utilization of an airport. The peak period users are not the ones who value them highly. Ideally, when the demand for a particular commodity exceeds the supply, there should be a differential pricing which will ensure that those who value the facilities most highly are allowed to use them.
- d. Another reason is the regressive nature of landing charges. Smaller aircraft (general aviation aircraft) which occupy the approach and runway facilities for a longer time, pay much lower landing charges, whereas larger aircraft pay higher charges.

- e. Similarly, at present, landing and other fees biases are similar among the airports in a particular country, even though costs of handling passengers and efficiency of the different airports are not the same. Unless these costs and efficiency differences are not reflected in landing and other charges, there will not be any inducement to airline operators to use the lower cost facilities.

The above review reveals that the existing price charging policies do not ensure the optimal usage of the airport nor allocation of resources efficiently. The aeronautical charges also do not provide a sound guide to future investment.

2.5.3 Marginal Cost Pricing Policy

The foregoing section reveals the deficiencies in the existing average cost pricing. This leads to the main question: what would be the right type of pricing policy which could result in the efficient use of resources. Economists have found the marginal cost pricing, where the price of goods or services was set equal to the marginal cost of providing those goods or services. It is the cost incurred in producing an additional unit of output. In the case of airports, if the price of an airport facility or services is set at its marginal costs, then it will only be used by those potential users who value it at least as much as the cost of producing it, this is the economic rationale for marginal cost pricing in the case of airports.

If marginal cost pricing is used, resources will be allocated by airport managers to providing additional facilities or services in the knowledge that potential users are prepared to pay the marginal or additional costs of the extra unit provided. On the other hand, if the airport charges are set below the marginal cost, some users will demand services for which they would not be prepared to pay the marginal cost. In such situations airports may increase the investment for additional facilities. But the users may not be prepared to cover the additional costs. Similarly, if

charges were set above the marginal costs, demand would decline and additional investment would not be fully prepared to cover the costs.

In both situations this is a loss of efficiency in the allocation of resources. In other words, if resources are to be used efficiently prices need to be set equal to marginal costs and this is done by calculating the capital cost of the new facility and converting it to an annual cost by discounting it to present day value, at the appropriate discount rate. This would produce a figure to be recovered each year, from those users identified as being in the peak period (Doganis, 1994).

2.5.4 Summary

The marginal average cost pricing structure is useful to ensure efficiency in allocation and use of airport resources, generate sufficient revenue to cover costs and provide a sound guide for future investment. However, the disadvantages of a traditional pricing structure are that there is no discrimination to aircraft manufactures, it stimulates the demand for airport facilities at the peak periods and reduces the demand for off-peak facilities. It does not ensure the optimum utilization of an airport, it imposes aggressive landing charges as smaller aircraft, which occupy the apron for a longer time, pay less charges than larger aircraft which occupy the apron for a shorter time period.

2.6 BAHRAIN CIVIL AVIATION AFFAIRS (CAA)

2.6.1 Introduction

Civil Aviation Affairs (CAA) was established on 1st of Jan 1972, under the Ministry of Development and Engineering Services. There were only about 100 employees. It was transferred to the Ministry of Development and Industry in 1980, and remained there until 1995. Currently, it is under the Ministry of Transportation with approximately 780 staff.

The CAA is responsible for providing facilities and services for all Civil Aircraft operating either through Bahrain International Airport (BIA) or through the Flight Information Region (FIR).

CAA also runs the airport and other facilities such as runways, taxiways, and terminal building and they ensure the standard of facilities and safety as laid down by the ICAO convention in Chicago in 1944. Bahrain became a party to the convention in 1st of Oct 1971.

Bahrain is party also to various other Conventions and protocols e.g. Tokyo, Hague, and Montreal which all deal with the security of Civil Aviation around the world.

2.6.2 CAA Responsibilities

CAA responsibilities are divided among many directorates namely:

- a. Air Navigation
- b. Air Transport
- c. Airport
- d. Engineering and Maintenance
- e. Administration and Finance
- f. Marketing and Promotions
- g. Quality and Planning
- h. Meteorological

Each Directorate deals within their own area of responsibility, to ensure that high standards of services are provided to all users of the airport and the air space controlled by Bahrain.

Each directorate's responsibilities are presented as follows:

a. Air Navigation

Air Navigation Directorate's main duties and responsibilities are to plan, implement and manage Air Navigation Services, in accordance with the rules, regulations, standards and recommended practices of ICAO, to provide the safe and orderly flow of Traffic within Bahrain FIR and Bahrain Aerodrome.

b. Air Transport

The Air Transport Directorate's main duties and responsibilities are to draw up and implement Air Transport Policies and Regulations in accordance with Civil Aviation Law and with International Civil Aviation Standards and recommended practices.

c. Airport

The Airport Directorate's main duties and responsibilities are to monitor the day to day operations of the airport, including all passenger and baggage handling activities, related to the movement of aircraft.

d. Engineering and Maintenance

The Engineering and Maintenance Directorate's main duties and responsibilities are to study and plan the development requirements of BIA, in line with the national development programs of the Government and in compliance with ICAO standards.

e. Administration and Financial Affairs

The Administration and Financial Affairs Directorate's main duties and responsibilities are to provide financial support services for all activities within the CAA.

f. Marketing and Promotion

The Marketing and Promotion Directorate's main duties and responsibilities are implement a comprehensive marketing strategy which would enable the achievement of the strategic national goal of positioning BIA.

g. Quality and Planning

The Quality and Planning Directorate's main duties and responsibilities are to provide a centralized source to undertake strategic planning activities, relevant to the development of the aviation industry in Bahrain.

h. Meteorological

The Meteorological Directorate's main duties and responsibilities are to act as the National Meteorological Center responsible for the collection / distribution and preparation of meteorological data, information and forecasts.

2.6.3 CAA capital investment programs

CAA objective is to make BIA one of the major hub airports in the world, by continuous investment in improving the existing facilities to provide high quality services, meet traffic growth requirements, maintain competitiveness, attract more foreign airlines and develop commercial opportunities.

Therefore, in order to meet the above objectives the CAA capital investment programs are as follows:

- a. To provide sufficient air bridges to meet peak demand.
- b. To develop the existing baggage system to meet peak demand and international security requirements.
- c. To provide additional car parking facilities to meet long term/Saudi passenger requirements.

2.6.4 CAA revenue stream

Airport revenue is generated from both aeronautical and non-aeronautical revenue. Aeronautical revenue is generated from landing, parking, over flying of aircraft and departure tax and it contributes 80% of total airport income. Non-aeronautical revenue or commercial activities, are those generated from concessions, shops and offices rents, duty free royalties and other income, which accounts for 20% of total airport income. Detailed revenues according to the CAA financial performance report are shown in Figure 2.3.

FIGURE 2.3
CAA Revenue Stream

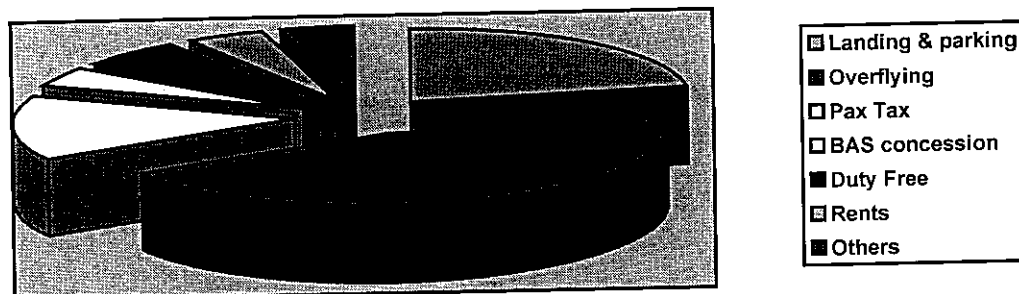
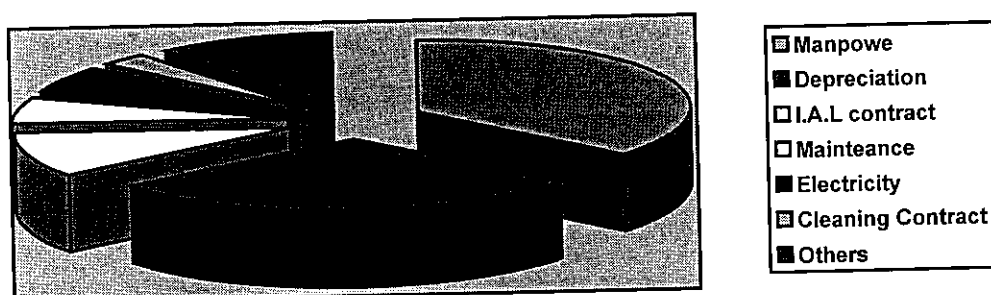


Figure 2.3 shows that over flying revenue represents the most significant part of aeronautical revenue and contributes 44% of total airport income. Duty free royalties represent the most significant part of non-aeronautical revenue and its contribution is 6% of total airport income.

2.6.5 CAA cost stream

CAA expenditures are categorized in various ways in different countries. However, Bahrain CAA costs are as follow:

FIGURE 2.4
CAA Cost Stream



Manpower cost is the largest single cost element, representing 37% of total airport costs. The second major cost element is depreciation which represent 28% of airport costs. Airports of Rome, Milan and Vienna have not charged depreciation on government finance assets. As a result, their capital charges are less than 20% of total airport cost.

The third cost element is the I.A.L contracts cost which represents 10% of total expenditure. Other cost elements together total 7% of total cost (overtime, training, conferences and missions, guest entertainment, telephone, telex, post, communication equipment lease, staff transport, insurance, consumables, airport promotion contribution and other services).

2.6.6 Summary

The CAA management structure is divided in to various responsibilities and authorities, as CAA activities contain a number of functional areas, i.e. air navigation, engineering, air transport, finance and administration, marketing and etc.

However, it is difficult to identify which directorate is more responsible for commercial policy in general, and for concessions in particular, to generate substantial revenues.

Airport revenues are generated from two primary sources airside and land side activities. Airside revenues are derived from airport traffic activities which concentrate on landing, parking and over flying of aircraft and passenger tax, while landside revenues are obtained from non-aircraft-related commercial activities in terminals (shopping, restaurants, car parking, car rental) and rents from airlines and concessionaires.

CAA management has a minimal influence on traffic volume, but they have great influence to increase revenue through concessions and aeronautical charges. This can be done by understanding the passengers behavior to capture the opportunity of additional concessions through providing a wide range of duty free shops that passengers prefer. Within an airport, CAA managers allocate additional space and land for advertising and shops, to attract a higher volume of passengers.

Taking in to consideration the airport's financial position, CAA management should operate BIA with a commercial oriented pricing policy, in order to achieve the following objectives:

- a. Ensure efficiency in allocation and use of airport resources.
- b. Generate revenue sufficient to cover costs and generate profit.
- c. Provide a sound guide for future investment.

An efficient allocation of airport resources requires that the price paid by any user, reflects the costs which they impose on the airport. If prices reflect costs, then two things follow. First, no one will purchase a particular airport service unless they value it and realize that the costs of producing reflect the price imposed on the user. Second, the risk of under-investment or over-investment, in particular airport facilities, is reduced or eliminated.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter includes the data gathering methods which were used to collect the information needed to conduct this study, and the data analysis techniques that have been used to analyze the data gathered in order to meet the purpose of the study.

3.2 DATA GATHERING METHODS

There are various types of data used in this research. First, secondary data, which are collected from publication and databases. Second, primary data, which are gathered, collected or observed first time. These data are new in nature, and usually collected by sample survey.

3.2.1 Monitoring Bahrain CAA performance and efficiency

Data gathered for analyzing CAA performance based on secondary data through the following:

- a. Historical monthly data, published by Administration and Finance Directorate of income statement and Air Transport Directorate of airport statistics over the period 1995-1998.
- b. The prediction of WLU and budgeted labour cost is based on the actual monthly secondary data over the period 1995-1998.

3.2.2 The BIA attractiveness analysis

- a. The analysis of this section is through using the DQM technique. The tourism attractiveness data were collected through primary data based on questionnaire survey. Eight hundred passengers were interviewed at the airport arrivals immigration and customs areas between 28 Jan and 30 Jun 1999 by asking them “what is the chief purpose of your trip today”. The interviews were conducted at various times through the day.
- b. The economic base analysis data were collected through secondary data by measuring the growth rate of transport and communication GDP over the period 1992-1997.

3.2.3 Bahrain CAA financial analysis

The CAA financial analysis is divided into the following:

- a. Income statement.
- b. Balance sheet.

The data gathering techniques adopted in each of the above, were based on the secondary data as follows:

a. Income statement

- a.1 Data gathered through audited financial performance of CAA over the period 1995-1998.
- a.2 Measured marginal average cost pricing on landing and parking charges the capital cost of two additional airbridges, cost of improving existing baggage handling and providing a multi storey car park.
- a.3 The overall level of landing and parking charges in option two can be increased or decreased up to a level determined by price cap formula (CPI-X) by using year 2000 estimated financial figures, traffic movement and forecasted cash flow for the next five years.
- a.4 Total landing and parking and over flying charges analysis is based on 1998 actual movement and revenue generated.

- a.5 Transfer to statutory reserve is collected through Bahrain Commercial Companies Law, 1975 (as amended) and Company's Memorandum and Articles of Association.

b. Balance sheet

The balance sheet data is based on the audited financial data collected through period 1995-1998.

3.3 DATA DESCRIPTION

3.3.1 Monitoring Bahrain CAA performance and efficiency

Part one of the analysis consists of overall CAA monthly performance analysis over the period 1995 – 1998, the examination of CAA efficiency and the forecasting technique of allocating the labor cost of any annual budget of any year.

3.3.2 The BIA attractiveness analysis

Part two of the analysis is, according to DQM, a function of tourist attractiveness and economic base in order to determine which quadrant BIA is based.

3.3.3 Bahrain CAA financial analysis

Part three of the analysis consists of a comparison of the income statements over the period 1995 – 1998 and balance sheets for 1997 and 1998. On the other hand, the forecasted income statements, balance sheets and cash flows for the next five years.

3.4 DATA ANALYSIS TECHNIQUES

3.4.1 Monitoring Bahrain CAA performance and efficiency

Part one of the analysis technique is based on the measurement of the input-output ratio, this technique measures the output generated by a given level of inputs, as output measure is the use of WLU which is a combination of both passengers and freight handled in tonnes x 10. It also adapts the monthly index techniques in order to allocate the monthly manpower budget to the overall annual CAA budget to achieve economies of scale and continued efficiency improvements.

3.4.2 The BIA attractiveness analysis

The attractiveness analysis technique is DQM as a function of tourist attractiveness and economic base.

3.4.3 Bahrain CAA financial analysis

3.4.3.1 Income Statement

There are many techniques used in calculating the forecasted income statement. They are summarized as follows:

- a. The value of X in the price cap formula (CPI-X) in option two of landing and parking charges is determined by measuring the following:

a.1 Weighted Average Cost of Capital (WACC)

WACC is what would be the total cost of employing different funds by the CAA, by using the following formula:

$$WACC = W_d K_d (1-T) + W_p K_p + W_s (K_e)$$

Where,

- W_d = target weight of debt
- K_d = the company before tax cost of debt
- T = tax
- W_p = preferred stock
- K_p = cost of preferred stock
- W_s = common stock
- K_e = cost of common stock

a.2 Net Present Value (NPV)

The Net Present Value (NPV) is the difference between the initial cost of a project and its discounted future cost inflows.

In other words, is the present value of all the cash flows connected with the project, all its costs and revenues, now and in the future, and is measured by the following:

$$NPV = \sum_{t=0}^n \frac{CF_t}{(1+k)^t} - CF_0$$

Where,

CF_0 = is cash outflow at period 0 (capital expenditure)

CF_t = is cash inflow at period t

n = number of period (life of the project)

k = Cost of Capital = WACC

a.3 Internal Rate of Return (IRR)

Internal Rate of Return (IRR) is a capital budgeting project's expected return. The IRR is defined as that discount rate which equates the present value of a project's expected cash inflows to the present value of the project's expected costs, (IRR) is measured by the following:

$$PV(\text{Inflows}) = PV(\text{Investment costs})$$

Or, equivalently,

$$\sum_{t=0}^n \frac{CF_t}{(1+IRR)^t} = 0$$

Where,

CF_0 = is cash outflow at period 0 (capital expenditure)

CF_t = is cash inflow at period t

n = number of period (life of the project)

0 = the NPV equals zero

a.4 Forecasted Cash Flow

The cash flow accounts principles were used to determine the new cash flow.

a.5 Forecasted Traffic Growth

Forecasted traffic growth is measured by adapting parametric statistics as inferential tools by using simple regression analysis of the past data, 1992-1998 of total arrivals and departure of passengers in the peak hours in order to calculate the value of t , which represents the traffic growth per year.

- b. In options three and four, landing charges are reclassified and increase the class intervals of weights of aircraft with the marginal increase in the charges for each class intervals by adapting sensitivity analysis to generate larger revenue rather than increasing the charges abruptly and losing business.
- c. In analyzing parking charges, we suggested a price based on other international airports, practicing policies, which is the area occupied by aircraft rather than MTOW.

- d. Over flying charges are calculated by using the iteration technique for option two and three, by considering many factors such as weight of aircraft, traffic movements, decrease or increase in income, loss of business, predicted growth and other GCC country over flying charges.
- e. In option two, the weights of aircraft are reclassified according to the percentage movements of light, medium and heavy aircraft instead of six categories according to the existing over flying charges structure, as small and heavy aircraft are not affected badly. However option three is reclassified into two categories to avoid income losses from small aircraft.
- f. For all options, the Air Navigation Department provides air traffic control services equally among all categories. By keeping this in mind, we minimize the class intervals of the aircraft as much as possible without making any losses and being in line with other GCC country charges.
- g. The prediction of other accounts in the income statement are made by using a descriptive technique as averages and other accounting principles.

3.4.3.2 Balance Sheet

Forecasted balance sheet is made by using a descriptive method such as averages and other accounting principles.

CHAPTER 4 ANALYSIS

4.1 MONITORING AIRPORT PERFORMANCE AND EFFICIENCY

4.1.1 Introduction

CAA performance indicators analysis depends on input-output ratio measurement. Output measure is the use of WLU and input are (labour, capital, etc). To ensure that airport management is making the best utilization of the resources.

4.1.2 Analysis

4.1.2.1 Work Load Unit (WLU)

WLU measures the volume of passengers and freight handled by an airport. The CAA WLU has improved overtime. Table 4.1 represents a periodic improvement of WLU on a monthly basis for the period 1995 – 1998.

TABLE 4.1
Monthly WLU (in units)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1995	399,957	312,725	378,475	358,044	246,361	353,865	401,563	421,592	399,579	361,289	354,780	386,724	4,474,954
1996	373,884	342,518	393,901	375,076	367,858	351,678	407,100	434,921	394,357	369,194	364,034	393,123	4,566,914
1997	370,671	348,965	392,565	379,871	351,694	345,778	409,422	424,522	390,627	390,414	392,720	414,308	4,611,557
1998	374,333	365,856	404,477	396,568	340,038	364,327	435,164	443,014	396,500	375,197	395,528	398,950	4,689,952

FIGURE 4.1
Monthly WLU (in units)

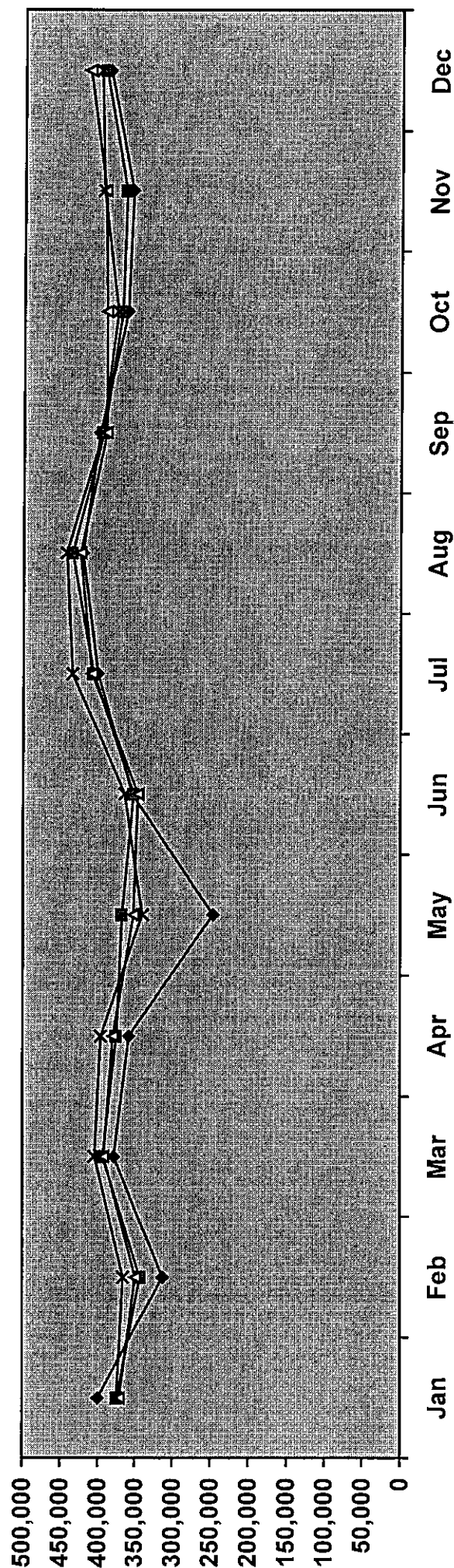


Figure 4.1 shows that overall WLU for all periods reached a higher volume in August, which were approximately 400 thousand units. This growth was due to peak season in summer as the number of passengers increased by 7% on average compared with other months.

On the other hand, WLU has increased from 4.5 million in 1995 to 4.7 million units in 1998, an increase of 5%. By comparing the input-output factors, 1998 produced more output for a reduced level of input. According to Table 4.2 in 1995, capital increased and staff numbers decreased from BD 1.3 million and 773 staff respectively to BD 3.9 million and 762 in 1996, and WLU increased from 4,474,954 to 4,566,914 units. Although capital increased to BD 5.4 millions in 1997, however staff numbers decreased to 741 from 762 in 1996, and WLU increased to 4,611,557 units in 1997. While in 1998 capital and staff numbers decreased to reach BD 2.1 million with 735 staff, WLU continued improvement and reached 4,689,952 units.

TABLE 4.2

Input Output Comparison

	1995	1996	1997	1998
<u>Input</u>				
Capital expenditure in BD m	1.3	3.9	5.4	2.1
Staff No.	773	762	741	735
<u>Output</u>				
(WLU)	4,474,954	4,566,914	4,611,557	4,689,952

In conclusion, there was a slight increase in WLU for a given period of time. CAA economic efficiency is in a strong position as more output is being generated for reduced levels of input, which means that airport management is making the best use of its resources to produce higher volumes of output.

4.1.2.2 Measure of overall cost performance

Cost performance analysis, in general, is to examine the following measurements:

1. Total cost per WLU (after depreciation)

To determine overall cost performance, it is necessary to start initially by looking at unit cost, which is total cost per WLU. According to Table 4.3 the highest WLU cost was in February 1996 and June 1997 of BD 3.7, mainly due to less WLU produced.

However, the lowest unit cost was in December 1995 at BD 1.2, mainly due to reduction in maintenance, electricity, staff transport and insurance cost.

Overall total cost per WLU over the period, was almost at the same level of BD 3.0 while there was slight increase of BD 0.3 in 1997 over 1996.

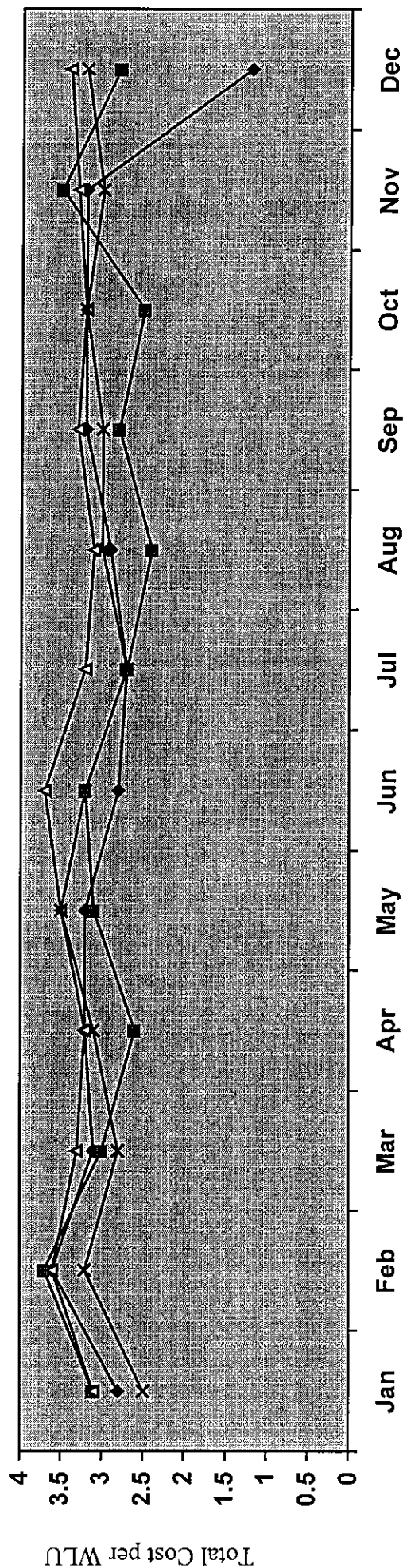
TABLE 4.3

Monthly total cost per WLU (after depreciation) in BD

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1995	2.8	3.6	3.1	3.2	3.2	2.8	2.7	2.9	3.2	3.2	3.2	1.2	3.0
1996	3.1	3.7	3	2.6	3.1	3.2	2.7	2.4	2.8	2.5	3.5	2.8	3.0
1997	3.1	3.6	3.3	3.2	3.5	3.7	3.2	3.1	3.3	3.2	3.3	3.4	3.3
1998	2.5	3.2	2.8	3.1	3.5	3.2	2.7	3	3	3.2	3	3.2	3.0

FIGURE 4.2

Monthly total cost per WLU (after depreciation) in BD



2. Operating cost per WLU (excluding depreciation)

The unit operating costs are substantially lower than their total units costs, due to high capital charge that is mainly depreciation costs. According to Table 4.4 the higher operating cost was in June 1997 at BD 2.8 due to higher manpower cost. And the lower unit operating cost was in September 1995 at BD 1.1 due to reduction in manpower, electricity and maintenance cost.

Overall total operating cost for the period increased from BD 1.9 in 1995 to reach the peak of BD 2.5 in 1997 and then declined to BD 2.2 in 1998. This decline is mainly due to reduction in training, maintenance, employees benefit expenses and there was no doubtful account expense.

3. Labour cost per WLU

There is a strong relationship between employment quality and levels of payments, because the quality of labor is affected by age, education, training, and other factors. First class airports should employ experts and professional people to run the most important departments and concentrate on operational departments. Therefore, this measure not only indicates the amount of labor resources being used but also will reflect differences in the relative wages and overtime paid over the period in order to increase productivity and airport output.

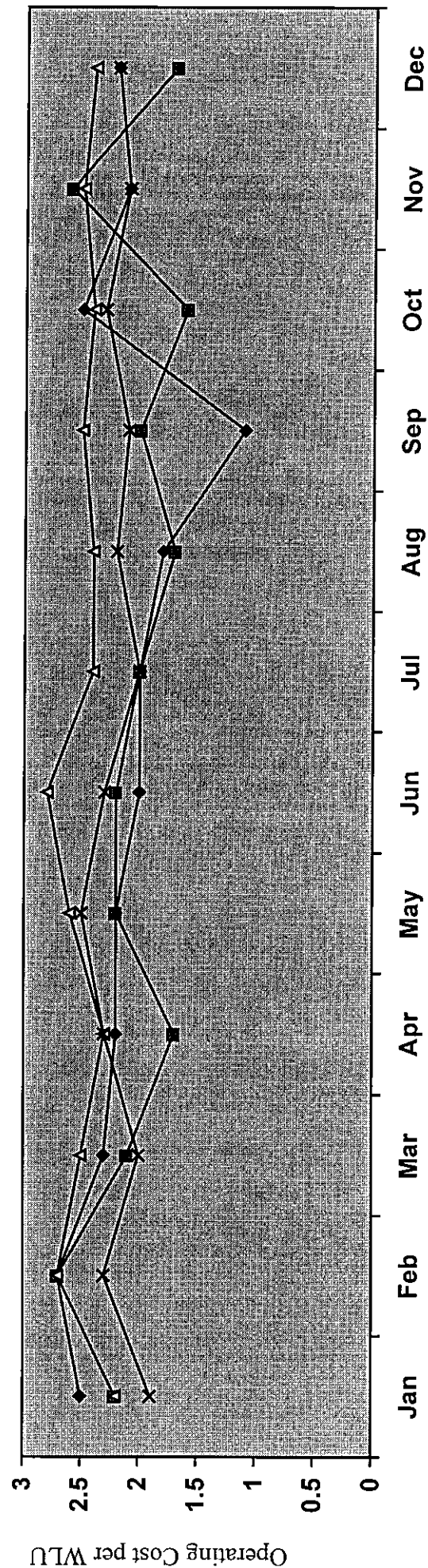
TABLE 4.4

Monthly operating cost per WLU (excluding depreciation) in BD

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1995	2.5	2.7	2.3	2.2	2.2	2.0	2.0	1.8	1.1	2.5	2.1	2.2	1.9
1996	2.2	2.7	2.1	1.7	2.2	2.2	2.0	1.7	2.0	1.6	2.6	1.7	2.0
1997	2.2	2.7	2.5	2.3	2.6	2.8	2.4	2.4	2.5	2.4	2.5	2.4	2.5
1998	1.9	2.3	2.0	2.3	2.5	2.3	2.0	2.2	2.1	2.3	2.1	2.2	2.2

FIGURE 4.3

Monthly operating cost per WLU (excluding depreciation) in BD



According to Table 4.5 labor costs are more significant than capital charges, and makes up 32 % - 37% of total cost. However, capital charges make up 25% - 30% of total cost. The highest labor cost per WLU was in June 1997 and May 1998 at BD 1.4. This is mainly due to lower WLU, approximately 345 thousands and 340 thousands units respectively. The lowest labor cost was in September 1995 due to high WLU at approximately 399 thousands units.

Overall labor costs per WLU over the period increased from BD 1.0 in 1995 to BD 1.1 in the following years. This increase in total labor cost is due to payment of higher overtime of BD 311,000 compared to BD 282,000 in 1995.

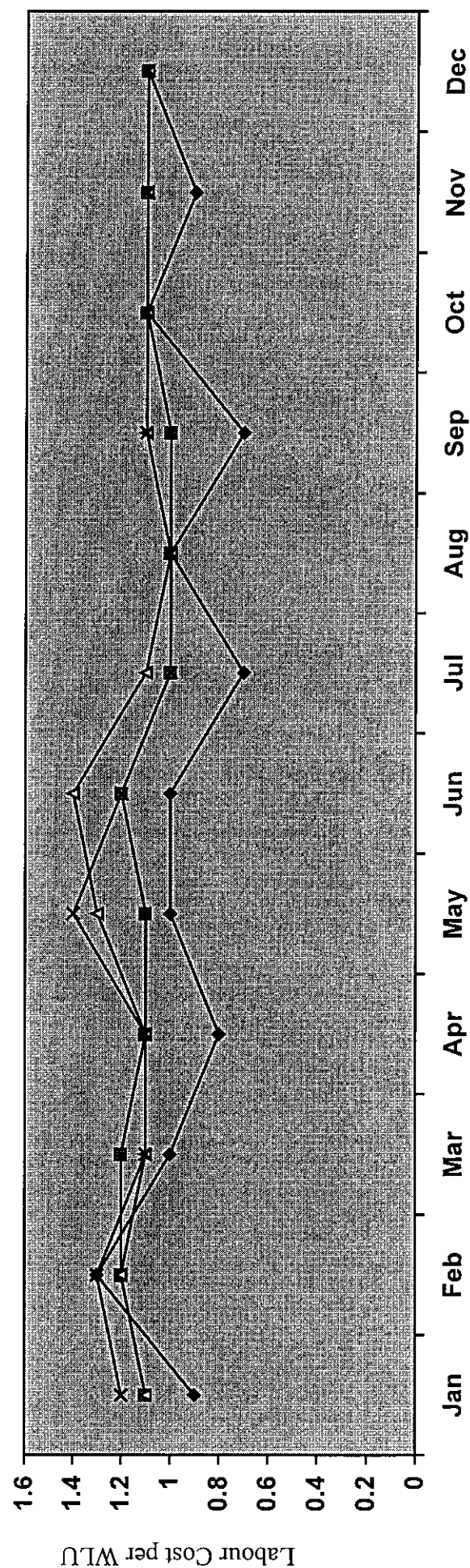
TABLE 4.5

Monthly labour cost per WLU in BD

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1995	0.9	1.3	1.0	0.8	1.0	1.0	0.7	1.0	0.7	1.1	0.9	1.1	1.0
1996	1.1	1.2	1.2	1.1	1.1	1.2	1.0	1.0	1.0	1.1	1.1	1.1	1.1
1997	1.1	1.2	1.1	1.1	1.3	1.4	1.1	1.0	1.1	1.1	1.1	1.1	1.1
1998	1.2	1.3	1.1	1.1	1.4	1.2	1.0	1.0	1.1	1.1	1.1	1.1	1.1

FIGURE. 4.4

Monthly labour cost per WLU in BD



4. Aeronautical cost per WLU

Aeronautical costs are those costs which arise from airside facilities and operations (radar, runways, taxiways, aprons, lighting, etc) including other terminal costs for traffic handling and other essential services. As aeronautical revenue per WLU are easy to establish and monitor, it is important to measure aeronautical cost per WLU and compare it with its associated revenue in order to determine the efficiency of aeronautical activities.

Table 4.6 shows the highest aeronautical cost per WLU which was in October 1995 and November 1997 due to higher aeronautical cost associated of BD 1,032 compared to BD 652 in 1995 and BD 995 in 1996 and BD 928 in 1998. However the lowest aeronautical cost per WLU was in December 1995 of BD 1.0.

Overall aeronautical cost per WLU over four years increased from BD 2.3 for 1995 and 1996 to reach the peak in 1997 of BD 2.7 and then declined to BD 2.5 in 1998, due to higher aeronautical cost associated in 1997 of BD 12,294 millions compare to BD 10,606 million in 1995, BD 10,671 million in 1996 and BD 11,506 million in 1998.

In conclusion CAA cost performance over the period 1995 to 1998 was not favorable but CAA has economies of scale in airport operations, as BIA's increasing traffic throughput the cost per unit of traffic decreased.

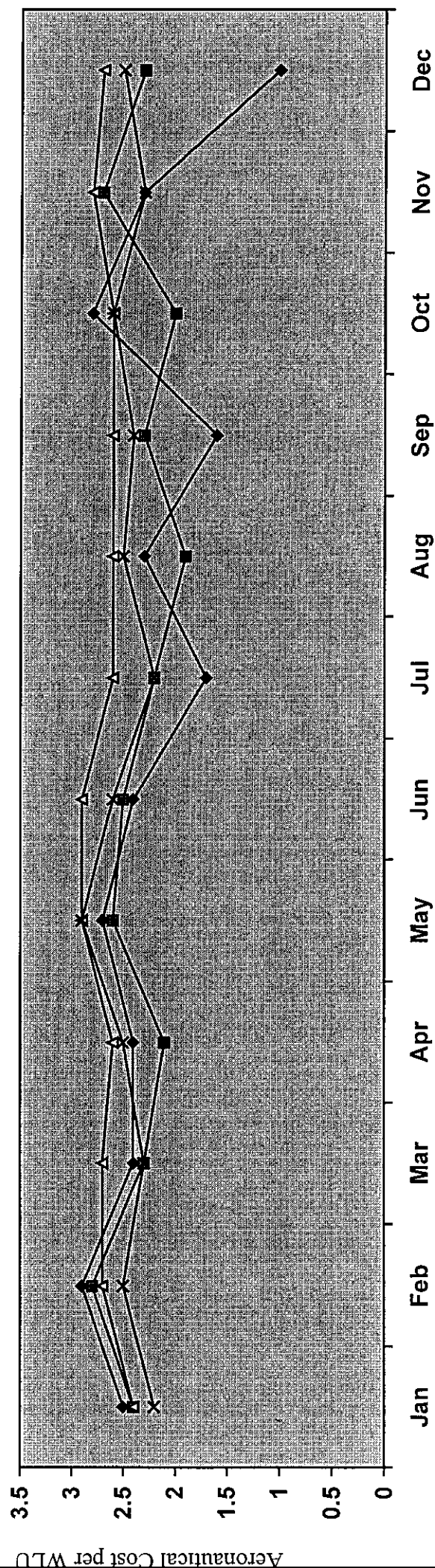
TABLE 4.6

Monthly Aeronautical Cost per WLU in BD

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1995	2.5	2.9	2.4	2.4	2.7	2.4	1.7	2.3	1.6	2.8	2.3	1.0	2.3
1996	2.4	2.8	2.3	2.1	2.6	2.5	2.2	1.9	2.3	2.0	2.7	2.3	2.3
1997	2.4	2.7	2.7	2.6	2.9	2.9	2.6	2.6	2.6	2.6	2.8	2.7	2.7
1998	2.2	2.5	2.3	2.5	2.9	2.6	2.2	2.5	2.4	2.6	2.3	2.5	2.5

FIGURE 4.5

Monthly Aeronautical Cost per WLU in BD



4.1.2.3 Labor productivity

Labor and capital are the two major input costs for airports. The following indicators can be used for monitoring labor productivity in addition to labor costs per WLU:

1. WLU per employee

This indicator measures the physical productivity of each airport employee. As indicated in Table 4.7, the highest labor productivity was in the year 1998, due to a decrease in number of employees, which resulted in higher output WLU, mainly in the peak season (July and August). However the lowest labor productivity was in February 1995 due to an increase in the number of employees which resulted in higher labor costs and lower output WLU.

Overall WLU per employee over the period 1998 registered a favorable labour productivity growth of approximately 6,381 WLU per employee. However, it was 5,789 WLU per employee in 1995.

2. Total revenue per employee

Total revenue of an airport authority is a better indicator of its overall activities. Therefore, total revenue per employee is a measure of the relationship between the airport, employees and revenues generated by the airport from all sources, either aeronautical activities or commercial activities.

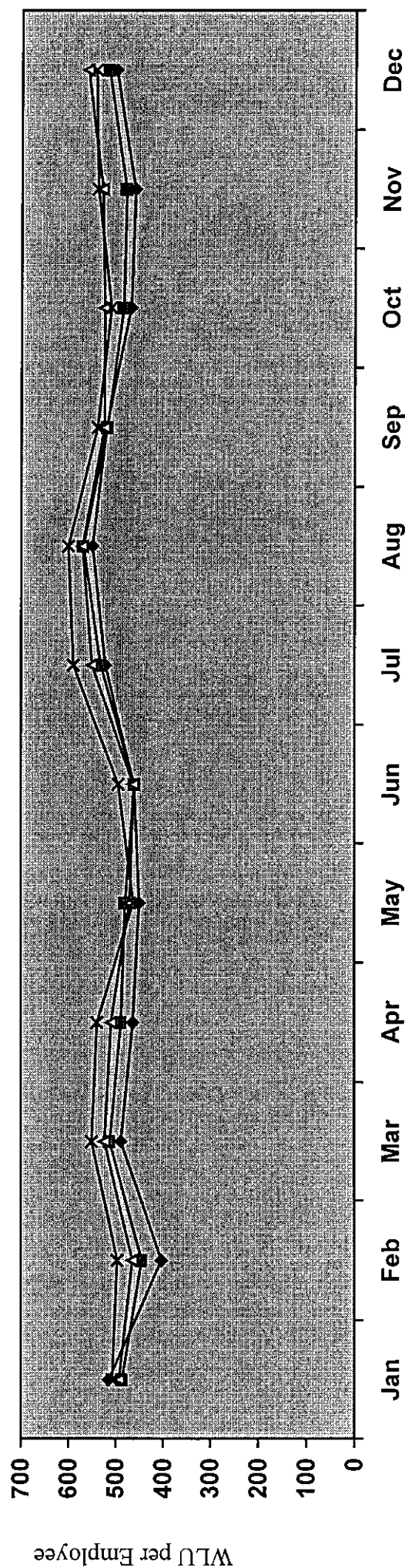
TABLE 4.7

Monthly WLU per Employee in units

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1995	514	403	488	463	450	461	522	549	520	468	460	500	5,789
1996	486	445	512	488	479	460	532	569	518	484	478	516	5,993
1997	492	464	523	509	470	462	550	571	524	525	529	560	6,223
1998	507	496	550	539	462	494	590	601	539	510	538	543	6,381

FIGURE 4.6

Monthly WLU per Employee in units



According to Table 4.8, the higher total revenue per employee was in March 1998 at BD 1,659, due to higher revenue generated at BD 1,221 with a decrease in the number of employees.

However, the lowest total revenue per employee was in December 1996 at BD 1,244. This decline was mainly due to a decline of aeronautical revenue (landing and parking charges, over flying charges and passenger tax).

Overall indicators show that the highest wealth generated by each employee was in 1998 with a total BD 18,040. This healthy indicator is generally due to higher productivity by each employee in 1998 of 6,381 WLU per employee, compared to 5,789 in 1995 as mentioned earlier in Table 4.7.

In conclusion, physical productivity of CAA labor is on a continuous increase while the number of employee decreased from 773 in 1995 to 735 in 1998. On the other hand CAA management is making the best utilization of the resources (employees) for less output (total revenue) which declined from BD 13,313 million in 1995 to BD 13,260 million in 1998. Therefore, the above analysis shows that when a decision is to be taken to privatize CAA, a new management should create a new methodology in calculating airport charges in order to maximize aeronautical revenue to be in line with labor productivity.

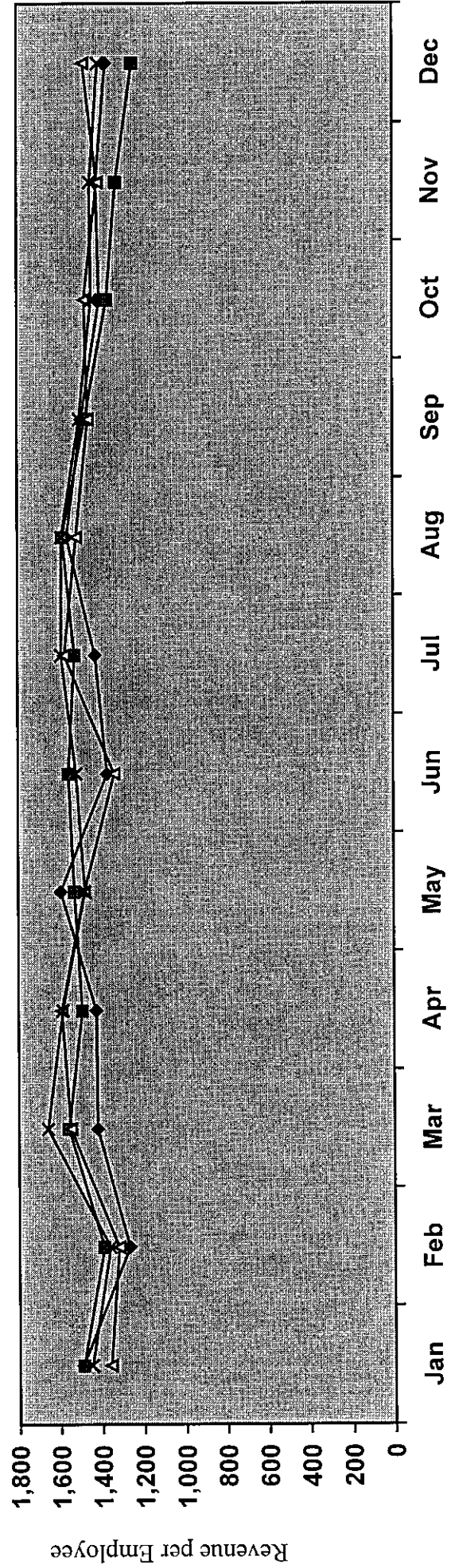
TABLE 4.8

Monthly Revenue per Employee in BD

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1995	1,492	1,268	1,419	1,423	1,592	1,368	1,424	1,560	1,488	1,400	1,415	1,371	17,223
1996	1,490	1,390	1,557	1,490	1,527	1,554	1,523	1,582	1,470	1,366	1,322	1,244	17,602
1997	1,359	1,319	1,547	1,589	1,478	1,334	1,572	1,515	1,456	1,473	1,411	1,478	17,678
1998	1,450	1,361	1,659	1,584	1,476	1,517	1,588	1,585	1,499	1,439	1,445	1,407	18,040

FIGURE 4.7

Monthly Revenue per Employee in BD



4.1.2.4 Revenue generation performance

There is a common relationship between airport size and revenue generation. According to 1998 statistics, smaller airports such as Bahrain, with 3.5 million passengers, Abu Dhabi 3.3 million, Dhahran of 3 million and Doha 2.5 million, depend on aeronautical revenues. As traffic grows, airports will put greater emphasis on commercial revenue which is generated from shops, rents, concessions etc. to meet airport demand. Therefore, revenue can be generated from aeronautical or non aeronautical services. The total revenue levels are effected by many factors i.e. UK government in privatizing BAA imposed formula $(RPI - X)$ which limited the BAA maximum annual increase on airport aeronautical revenue, where RPI was the increase in revenue in retail price index and X an efficiency factor which allowed economies of scale in airport operations. Other factors include, whether the airports themselves undertake functions such as handling or operation of duty free shops, which is normally provided by others.

In our revenue analysis, we are going to measure three revenue performances:

1. Total revenue per (WLU)

This indicator measures the overall performance of an airport in generating revenue, either of both aeronautical revenue which contributes 80% of total revenue or non aeronautical revenue which contributes 20% of total revenue.

According to Table 4.9 the highest revenue generated from one WLU was in May 1995 at BD 3.5. This healthy amount was mainly due to high revenue generated from landing and passenger revenue which reached BD 1,470,000 and BD 853,000 respectively, compared to BD 1,466,000 and BD 630,000 in 1996, BD 1,261,000 and BD 767,000 in 1997 and BD 1,222,000 and BD 767,000 in 1998. However, the lowest revenue per WLU was in December 1996 at BD 2.4, mainly due to a decrease in landing, over flying, rents and duty free royalties.

Overall revenue per WLU, was particularly successful in generating high levels of unit revenue in 1995, due to higher aeronautical revenue and non-aeronautical revenue.

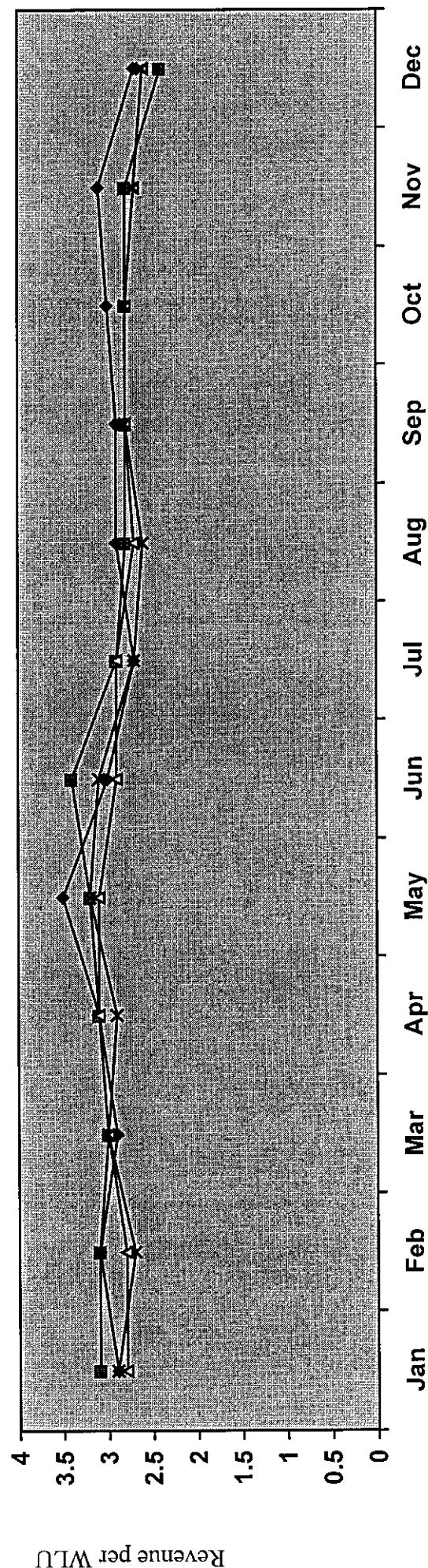
TABLE 4.9

Monthly Revenue per WLU in BD

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1995	2.9	3.1	2.9	3.1	3.5	3	2.7	2.9	2.9	3	3.1	2.7	3
1996	3.1	3.1	3	3.1	3.2	3.4	2.9	2.8	2.8	2.8	2.8	2.4	2.9
1997	2.8	2.8	3	3.1	3.1	2.9	2.9	2.7	2.8	2.8	2.7	2.6	2.8
1998	2.9	2.7	3	2.9	3.2	3.1	2.7	2.6	2.8	2.8	2.7	2.6	2.8

FIGURE 4.8

Monthly Revenue per WLU in BD



2. Aeronautical revenue per WLU

This indicator shows us how much traffic or WLU collects charges from aircraft landing fees, passenger tax, parking fees and over flying charges. Although it will show us an airport's success in generating such revenue over the period, however, these charges depend on the level and structure of airport charges which might be influenced by the government.

According to Table 4.10, the highest aeronautical charges per WLU was in March 1995 and June 1996 at BD 2.7. This higher revenue was mainly due to higher landing, parking and over flying charges. The lowest charge was in December 1996 due to lower revenue from landing and parking.

Overall, the successful years of generating higher level of revenue per traffic unit was in 1995, 1996 and 1997 at BD 2.3. However, 1998 aeronautical revenue per traffic unit decreased to BD 1.9 because the proportion of increase of such revenue was less than the increase in traffic units.

3. Non aeronautical revenue per WLU

This measures the ability of an airport's management to capitalize on the whole range of commercial opportunities open to it. Generally, airports with a low traffic volume, such as Bahrain at 3.5 million passengers for 1998, will be more dependent on aeronautical revenues. Dubai airport

on the other hand, with 9 million passengers depends on both aeronautical and non-aeronautical revenues.

According to Table 4.11, the highest WLU generated revenue was in January and February 1996 at BD 1.0, mainly due to increases in duty free royalties, while the lowest revenue generated was in July 1995 at BD 0.2 due to decreases in BAS revenue, as the company did not start to pay lease payments for new projects of the Aircraft Catering Unit and Cargo Terminal until 1996. Although there was a decrease in Duty Free royalties, due to a decrease in net profit as CAA deducted 50% of the company's net profit.

Overall, non-aeronautical revenue per WLU for the period, registered a minimal decline because the ability of airport management to capitalize on the whole range of commercial opportunities beyond their control. For example, they cannot force rental to rent all shops, or the traffic being handled is not as large a volume as 1995 and 1996, which could result in a decrease of car park income. Due to the above reasons non-aeronautical revenue per WLU declined from BD 0.6 in 1995 and 1996 to BD0.5 for 1997 and 1998.

In conclusion, BIA is considered a small airport relative to other Middle East airports and is dependent on aeronautical revenue. CAA management have not put greater emphasis on commercial activities.

TABLE 4.10

Monthly Aeronautical Revenue per WLU in BD

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1995	2.3	2.2	2.7	2.4	2.4	2.4	2.2	2.2	2.3	2.2	2.2	2.3	2.3
1996	2.3	2.4	2.4	2.6	2.6	2.7	2.3	2.2	2.3	2.2	2.2	2	2.3
1997	2.2	2.2	2.4	2.5	2.6	2.3	2.3	2.2	2.2	2.3	2.1	2.1	2.3
1998	2.3	2.2	2.5	2.4	2.6	2.5	2.2	2.2	2.3	2.3	2.2	2.1	1.9

FIGURE 4.9

Monthly Aeronautical Revenue per WLU in BD

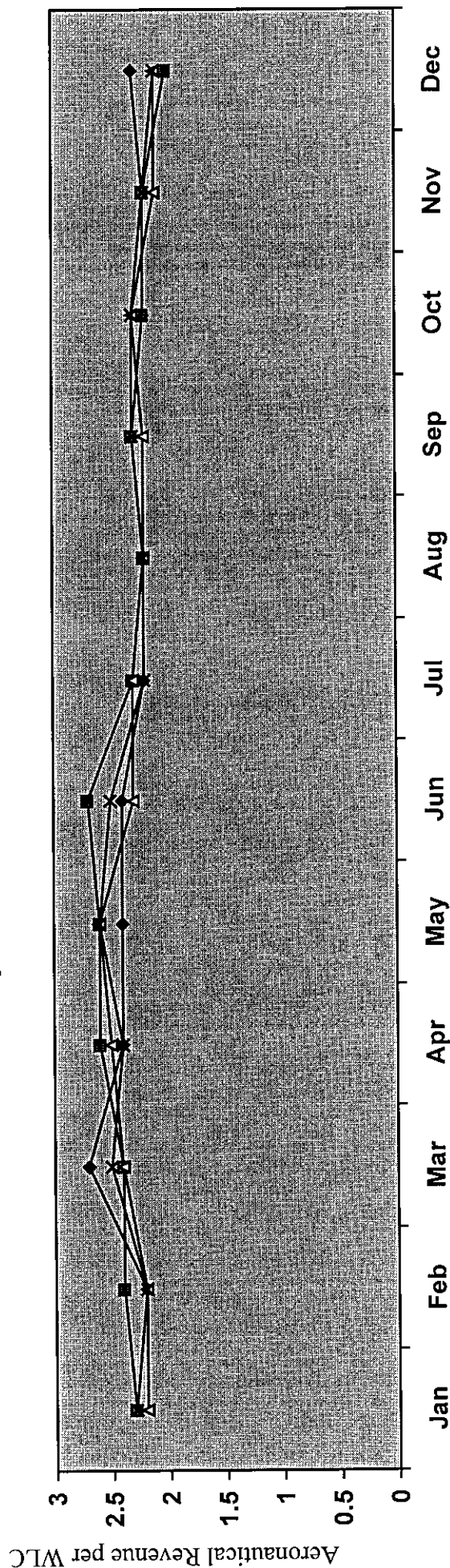


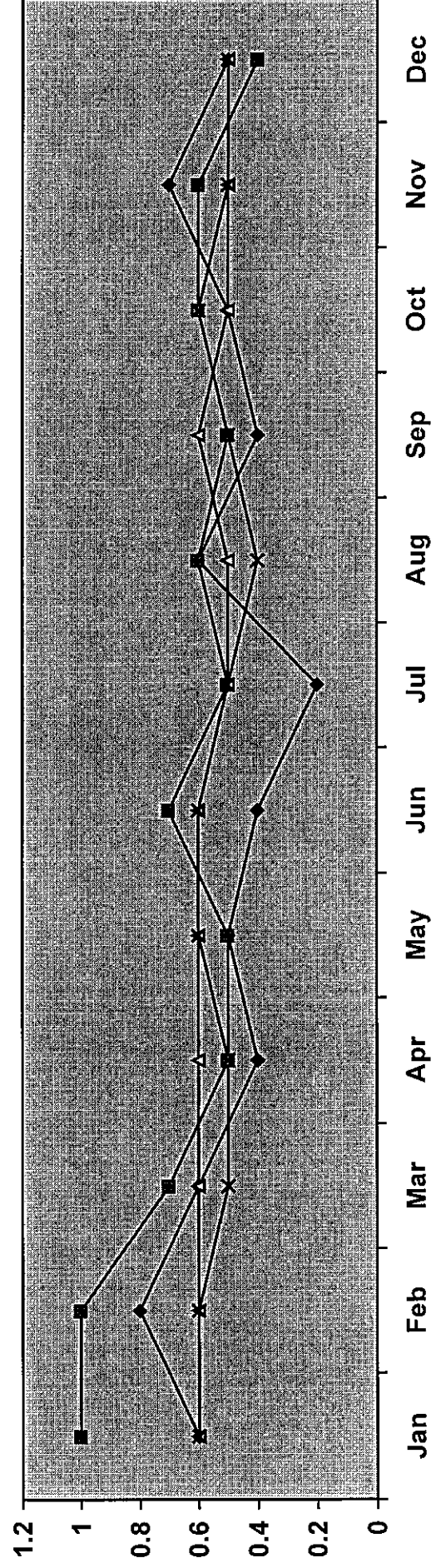
TABLE 4.11

Monthly Non Aeronautical Revenue per WLU in BD

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1995	0.6	0.8	0.6	0.4	0.5	0.4	0.2	0.6	0.4	0.5	0.7	0.5	0.6
1996	1.0	1.0	0.7	0.5	0.5	0.7	0.5	0.6	0.5	0.6	0.6	0.4	0.6
1997	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.5
1998	0.6	0.6	0.5	0.5	0.6	0.6	0.5	0.4	0.5	0.6	0.5	0.5	0.5

FIGURE 4.10

Monthly Non Aeronautical Revenue per WLU in BD



4.1.2.5 Performance of commercial activities

In recent years airports have become more commercially oriented as they have to increase their share of revenue and their profit from commercial or non- aeronautical activities. They are doing this because of growing number of passengers.

Reasons for monitoring the non-aeronautical area is first, airports are trying to generate an additional increase in total revenue from commercial activities. Second, concession and rental revenues are much more under the control of airport management than aeronautical revenue which may be controlled by governments or levels of traffic. Therefore, the airport manager has a greater scope to improve performances in the commercial areas than in the aeronautical resources.

Commercial activities performance is divided into the following:

1. Concession plus rental income per passenger

In order to monitor the commercial revenue generated per passenger handled, we should assess the concession plus rental income per passenger. According to Table 4.12 CAA revenue from all concession fees and rents per passenger handled was marginally higher in July 1995 at BD 0.9, partly due to higher duty free royalties. However, the results in January, June and December 1995, December 1996 and August 1998, were poor mainly due to lower rent.

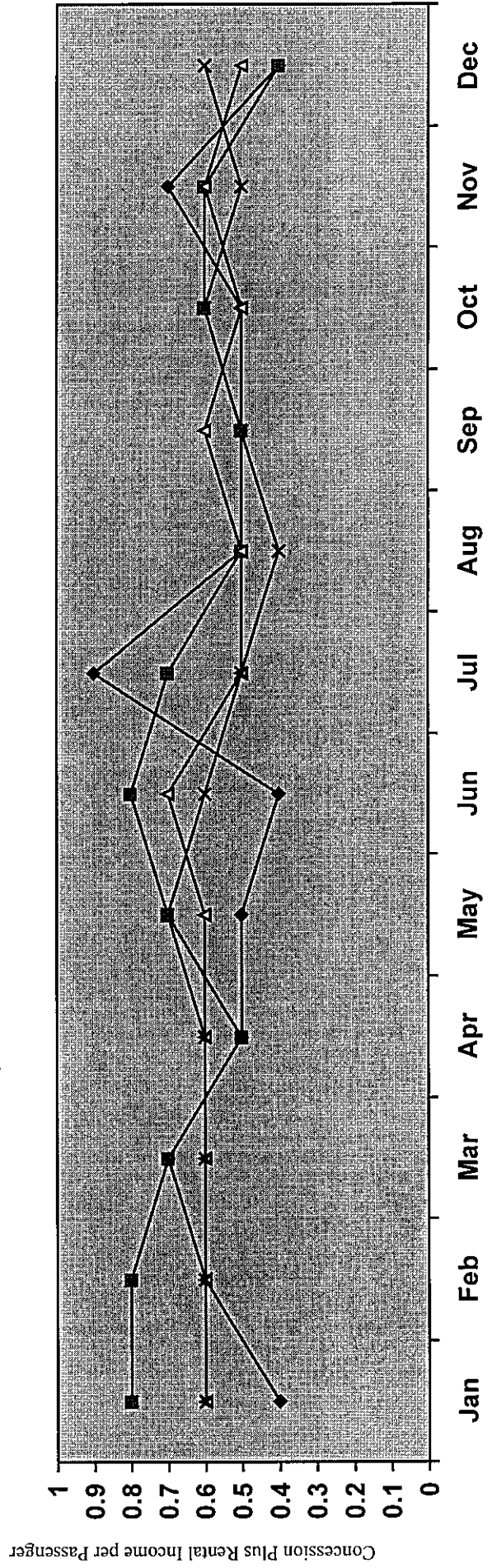
TABLE 4.12

Monthly Concession plus Rental Income per Passenger in BD

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1995	0.4	0.6	0.7	0.5	0.5	0.4	0.9	0.5	0.5	0.5	0.7	0.4	0.5
1996	0.8	0.8	0.7	0.5	0.7	0.8	0.7	0.5	0.5	0.6	0.6	0.4	0.6
1997	0.6	0.6	0.6	0.6	0.6	0.7	0.5	0.5	0.6	0.5	0.6	0.5	0.6
1998	0.6	0.6	0.6	0.6	0.7	0.6	0.5	0.4	0.5	0.6	0.5	0.6	0.6

FIGURE 4.11

Monthly Concession plus Rental Income per Passenger in BD



Overall indicators show an improvement over the period as concession and rent income per passenger increased from BD 0.5 in 1995 to BD 0.6 in 1996, 1997 and 1998.

This constant level is mainly due to BAS being committed for lease payment of a constant amount per annum, for a period of twenty five years commencing 1st Jan 1996.

2. Concession revenue per passenger

According to Table 4.13 concession revenue per passenger is slightly below the previous indicators, which means that CAA commercial activities is mainly from concessions. The highest revenue generated per passenger in July 1995 at BD 0.7. The lower concession revenue per passenger was in December 1995 and 1996 at BD 0.2. The reasons are explained earlier in point 1.

3. Rent revenue per passenger

It is clear from Table 4.14 that rent revenue per passenger varies between a range of BD 0.1 and BD 0.2 all over the period. This means that the total area is fully occupied by rentals all through the period and no further expansion has been carried out in the period concerned.

TABLE 4.13

Monthly Concession Revenue per Passenger in BD

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1995	0.3	0.4	0.6	0.4	0.4	0.3	0.7	0.3	0.3	0.4	0.5	0.2	0.4
1996	0.6	0.6	0.5	0.3	0.5	0.6	0.4	0.4	0.4	0.5	0.5	0.2	0.4
1997	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.3	0.4	0.4	0.4	0.4	0.4
1998	0.4	0.4	0.4	0.4	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4

FIGURE 4.12

Monthly Concession Revenue per Passenger in BD

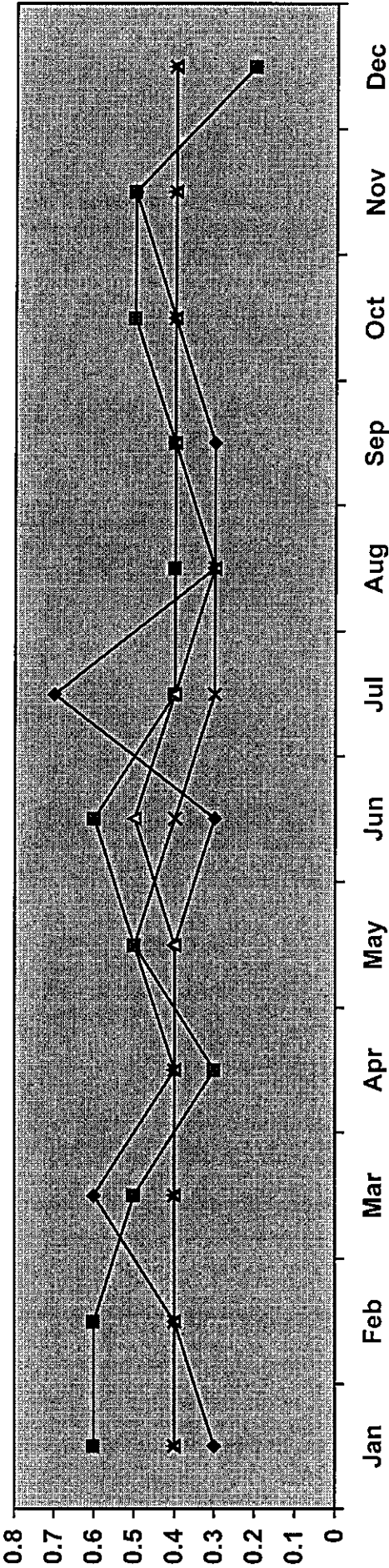


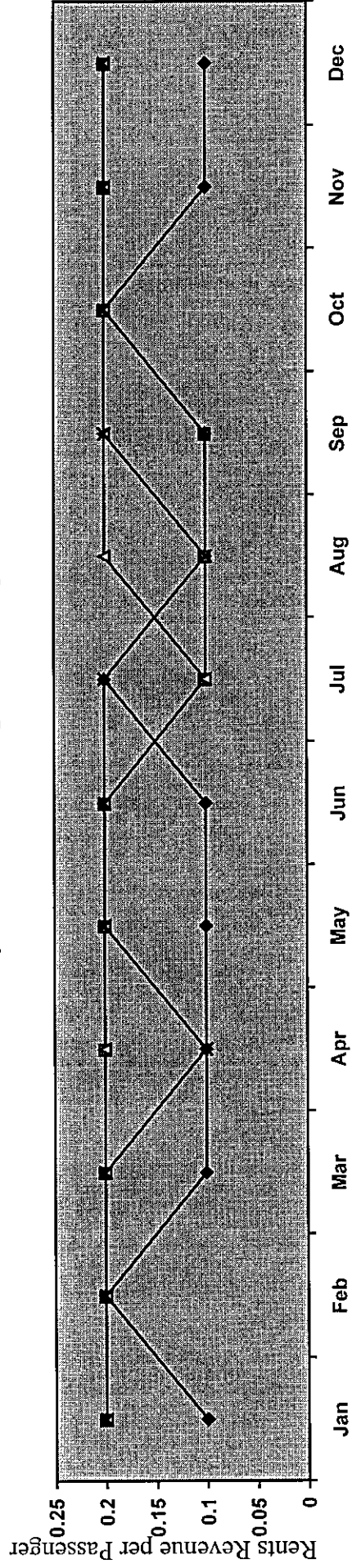
TABLE 4.14

Monthly Rents Revenue per Passenger in BD

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1995	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1
1996	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2
1997	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2
1998	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2

FIGURE 4.13

Monthly Rents Revenue per Passenger in BD



4.1.2.6 Profitability measures

There are two common measures of profitability. First measure is that of profit/deficit per WLU, which relates airport profit to the traffic. It will show how much profit is generated from each unit of output, which is going to indicate the profit margin in terms of the difference between total unit costs and unit revenues, expressed per unit of output, that is work load units.

This will depend on the revenue to expenditure ratio, as this ratio is total revenue to total cost. Expressed in percentage terms, any figure above 100% indicates profitability for example, a ratio of 1.02 (or a percentage of 102) would indicate that revenue exceeds cost by 2 per cent, 100% being break-even and below 100% being a loss. This measure reflects how successful the airport has been in covering its costs.

According to Tables 4.15 and 4.16 the highest profit margin per WLU in December 1995 at BD 2.0 because revenue to expenditure ratio was 232% which indicates profit. However, the highest loss incurred per unit of output in June 1997 at BD 1.0 with revenue to expenditure ratio of 78%.

Overall profitability of the period declined when revenue exceeded expenditure by 1 percent in 1995 to 95% which was less than 100% in 1998. The only break even point was achieved in 1996.

TABLE 4.15

Monthly Surplus or Deficit per WLU in BD

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1995	0.1	-0.4	-0.2	-0.2	0.4	-0.2	-0.1	0.2	-0.1	-0.2	-0.1	2	0.1
1996	-0.02	-0.5	0.1	0.5	0.1	0.2	0.1	0.3	0.01	0.6	-0.7	-0.4	0.02
1997	-0.3	-0.7	-0.3	-0.02	-0.4	-1.0	-0.4	-0.5	-0.5	-0.4	-0.6	-0.8	-0.6
1998	0.2	-0.4	0.2	-0.1	-0.3	-0.1	-0.02	-0.3	-0.1	-0.4	-0.2	-0.6	-0.2

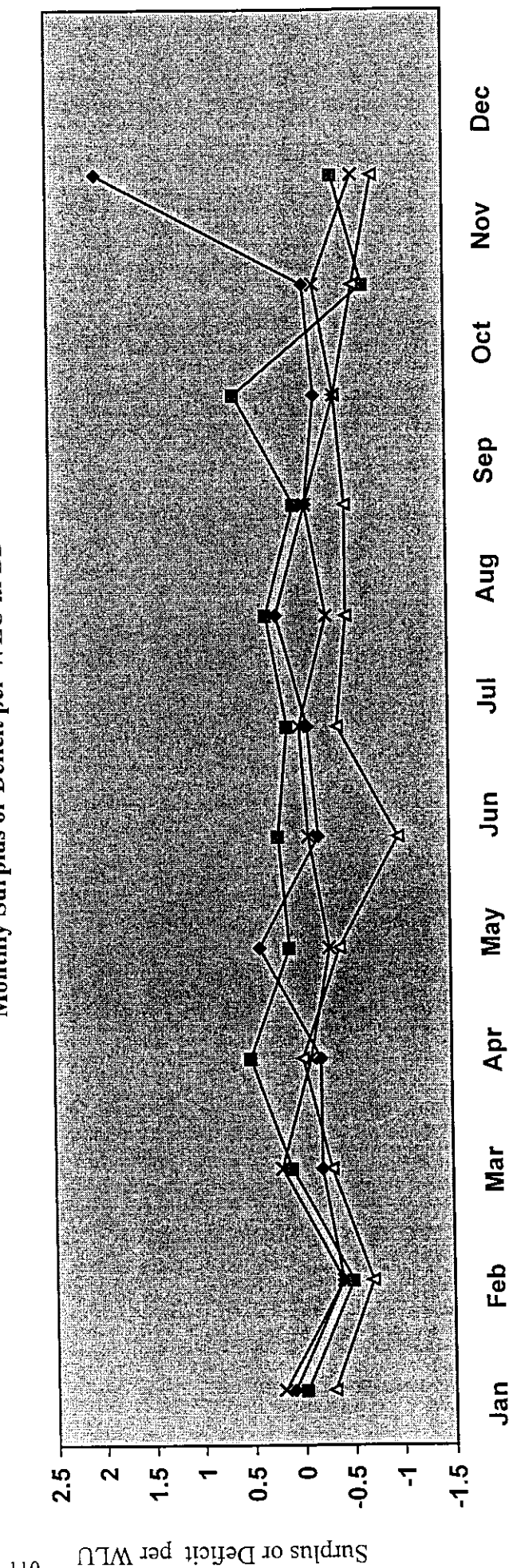
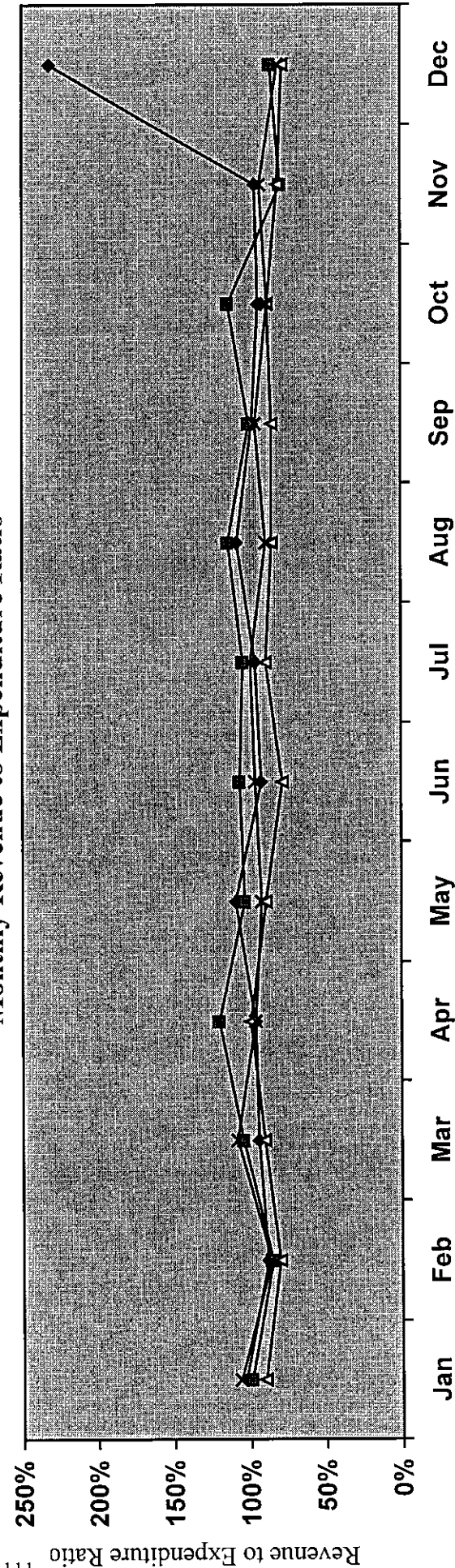
FIGURE 4.14
Monthly Surplus or Deficit per WLU in BD

TABLE 4.16

Monthly revenue to expenditure ratio

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1995	103%	88%	94%	96%	109%	92%	96%	108%	98%	94%	96%	232%	102%
1996	99%	85%	104%	120%	103%	106%	104%	114%	100%	114%	79%	86%	100%
1997	90%	80%	90%	99%	89%	78%	89%	85%	85%	88%	81%	78%	86%
1998	106%	86%	108%	96%	92%	96%	99%	89%	96%	88%	93%	81%	95%

FIGURE 4.15
Monthly Revenue to Expenditure Ratio



In conclusion, CAA annual profit has been declining which has resulted in low profit per WLU and low revenue-expenditure ratio. The financial position of CAA is not bright and potential investors will hesitate to invest in such an airport.

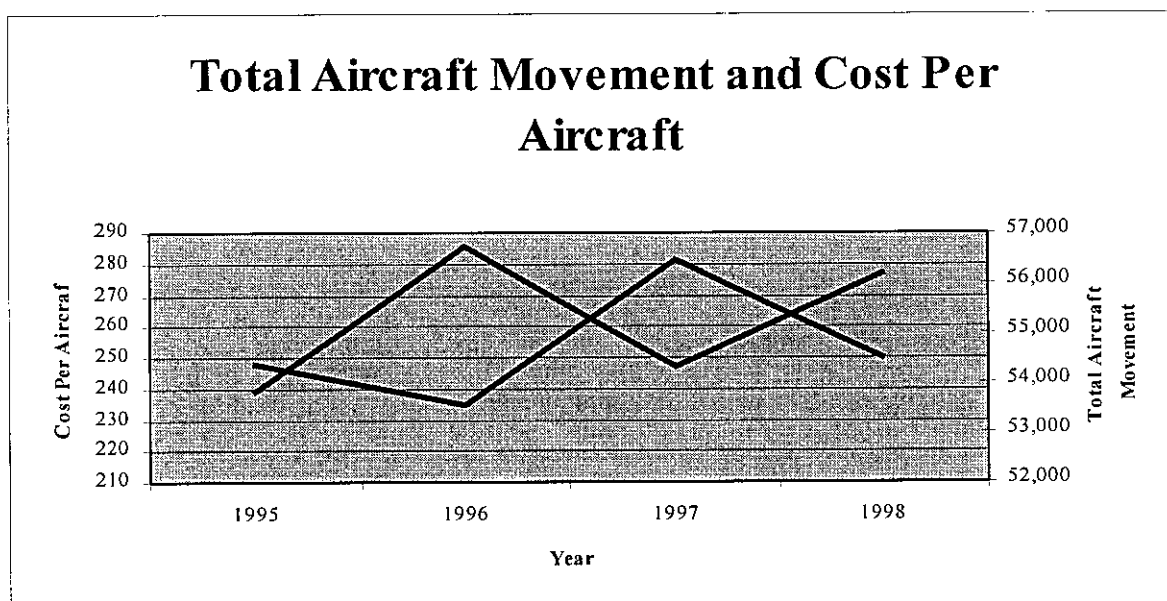
In monitoring CAA efficiency, we are going to examine the efficiency of CAA in terms of the following:

- a. Number of aircraft movements and cost of aircraft.
- b. Total WLU and manpower costs.

a. Number of aircraft movements and cost of aircraft

It is seen from Figure 4.16 that there are economies of scale in airport operations. The cost of handling each aircraft decreased as traffic increased for the period 1995-1998.

FIGURE 4.16
Number of Aircraft Movements and Cost of Aircraft



b. Total WLU and manpower costs

As with CAA productivity, according to Figure 4.17, actual WLU per manpower costs decreased as actual WLU increased and vice versa for the same period.

However, we specified earlier in the literature review, manpower cost is considered a controllable cost of total CAA cost. Therefore, in order to achieve economies of scale in future in terms of manpower cost and WLU, we allocated a percentage of labor costs on a monthly basis of any annual budget of any year (see Figures 4.17 and 4.18).

FIGURE 4.17
CAA productivity

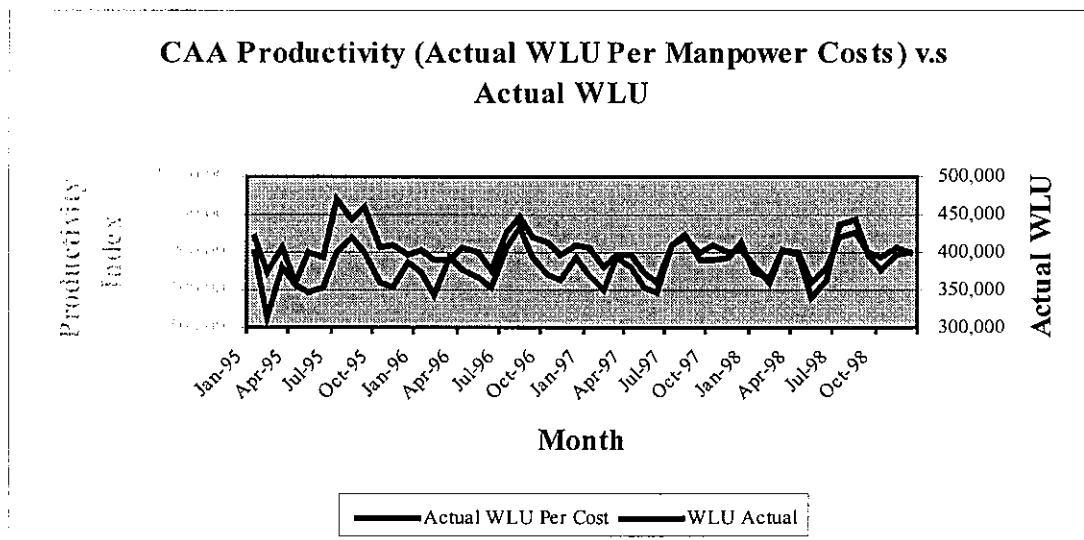
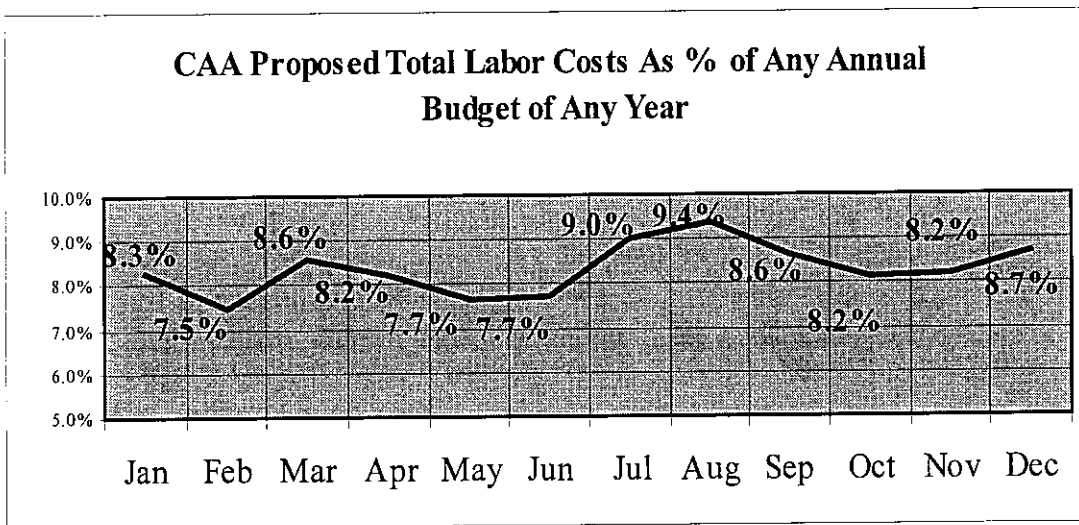


FIGURE 4.18

CAA Proposed Labor Costs as % of any Annual Budget of any Year



4.1.3 Overall conclusion

CAA performance indicators show that the airport management is making the best use of the resources (staff and capital) and CAA efficiency is in a strong position as more output is being generated WLU for reduced levels of input.

By measuring cost performances, CAA is not in a favorable position, but has economies of scale because cost per unit decreased as traffic throughput increased. CAA can achieve economies of scale in term of manpower costs by allocating a certain budget for manpower costs per month from the total CAA budget of any year.

In privatizing CAA, a new management should take further steps to apply a new methodology of calculating airport charges, because the existing bases of airport charging is not efficient to maximize revenue and cover the associated costs.

Finally, it is clear that BIA has not tried to develop other potential opportunities to maximize commercial activities and increase non-aeronautical revenue, as can be seen from the marginal increase in traffic.

4.2 BAHRAIN INTERNATIONAL AIRPORT

ATTRACTIVENESS MEASUREMENT

4.2.1 Introduction

The airport attractiveness level is a function of quality of the destination it serves, which can be analyzed through using the DQM as specified earlier in airport literature review.

4.2.2 Data analysis

We asked 800 arriving passengers through immigration and customs area “What is the chief purpose of your trip today ?” (See Appendix 1 for the complete questionnaire).

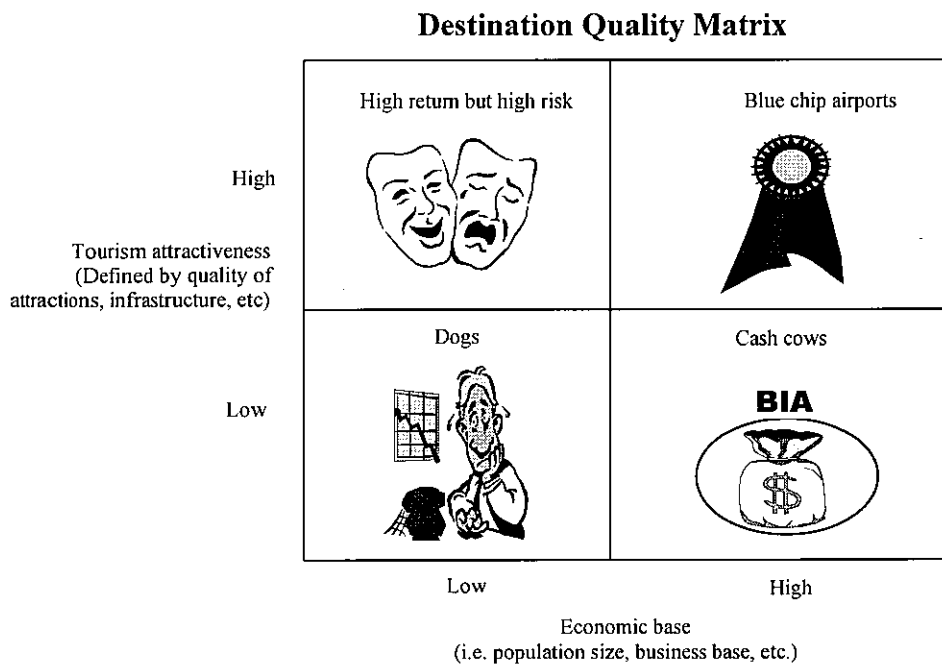
51% of the passengers responded: “ business trip”. 23% responded “visiting friends and relatives”. However, tourists were 13% only and others were 13%.

The economic base of the transport and communication sector is in a good position, as their contribution to GDP increased from BD 146.9 millions in 1992 to BD 168.7 millions in 1997.

Therefore, BIA would be in the cash cows quadrant, which is the next most attractive airport for investors after quadrant 1 which is blue chip airports. BIA has a strong economic base but low tourism attractiveness.

Generally it has a stable income stream because traffic flows depend on business trip and visiting friends and relatives, but it is unlikely to achieve spectacular growth.

FIGURE 4.19



4.2.3 Overall conclusion

According to the previous analysis of DQM, it provides an airport strategy to strengthen their market position. BIA needs to strength its position by securing as much “business” and “visiting friends and relatives” traffic. However, it also needs to identify new route opportunities by adopting a segmentation approach to exploit the economic base at a micro-market level. On the other hand, to improve BIA’s position on the DQM to reflect profitability, it needs to create a new strategy to develop tourism and related infrastructures.

4.3 BAHRAIN CIVIL AVIATION AFFAIRS

FINANCIAL ANALYSIS

4.3.1 Introduction

The CAA performance conclusion of financial results suggests that the functioning of the CAA and the existing system of controlling the functions of the airport is not up to the required level and CAA has been making a loss in the past years. The Government cannot tolerate such loss making enterprises even though it is an essential requirement of the country.

As mentioned earlier in the literature review, the drawback of privatization is that a private enterprise will give more importance to profit maximization at the expense of safety and security. On the other hand, it has to meet the financial requirement for the new projects as well as the efficient and effective function of CAA. Therefore, the following analysis is going to present details of forming a separate company as an example of privatizing CAA, in order to improve the CAA's financial performance, new sources of liquidity, sound accounting principles and the future financial impact of privatization.

4.3.2 Data analysis

4.3.2.1 Income statement

The following are the comparative profit and loss accounts for the years ended 31st December.

TABLE 4.17

Income Statement Comparison

Income in BD'000	1994	1995	1996	1997	1998
<u>AERONAUTICAL INCOME</u>					
Landing and Parking	3,752	3,556	3,312	3,068	3,010
Over flying	5,158	5,370	5,562	5,572	5,881
Passenger Tax	1,933	1,920	1,845	1,929	1,937
Clearing Fees	86	38	27	30	25
TOTAL	10,929	10,884	10,746	10,599	10,853
<u>COMMERCIAL INCOME</u>					
Rents	386	461	570	566	609
B.A.S Concession	501	502	598	570	560
Duty Free Royalty	581	844	920	797	746
Car Park	146	98	67	66	61
Recovery of Charges	251	269	226	245	244
Advertising	85	113	111	99	70
Other Income	107	142	175	157	146
TOTAL	2,057	2,429	2,667	2,500	2,436
TOTAL INCOME	12,986	13,313	13,413	13,099	13,289
<u>EXPENDITURE</u>					
I.A.L Contract	1,526	1,416	1,416	1,436	
Cleaning Contracts	347	335	344	375	
Depreciation	3,991	4,006	4,098	3,908	3,865
Maintenance	1,272	804	659	898	630
Airport Promotion Contracts	100	100	100		
Manpower	4,387	4,571	4,632	4,897	5,318
Overtime	397	282	311	316	320
Training	410	182	148	204	
Conferences and Missions	114	128	114	128	
Guest Entertainment	53	34	45	56	
Telephone, Tlx, Post	186	164	170	238	3,805
Electricity-Variable	823	582	886	802	
Communication equipment. Lease	171	145	102	358	
Staff Transport	49	49	58	4	
Insurance	132	110	137	136	
Consumables	95	55	72	98	96
Doubtful Account Expenses				998	
Employees Benefit Expenses				325	
Other Services	35	55	61	61	
TOTAL EXPENDITURE	14,088	13,018	13,353	15,238	14,034
NET PROFIT / (LOSS)	(1,102)	295	60	(2,139)	(745)

Source: CAA audited income statement reports 1998.

However, the projected profit and loss account for the year ended 31st December are as follows:

TABLE 4.18
Forecasted Income Statement Comparison

Income in BD'000	2000	2001	2002	2003	2004
<u>AERONAUTICAL INCOME</u>					
Landing and Parking	3,970	4,079	4,181	4,286	4,372
Over flying	9,079	9,327	9,582	9,844	10,114
Passenger Tax	3,800	3,924	4,052	4,183	4,319
Clearing Fees	30	30	30	30	30
TOTAL	16,879	17,360	17,845	18,343	18,835
<u>COMMERCIAL INCOME</u>					
Rents	650	650	650	650	650
B.A.S Concession	576	576	576	576	576
Duty Free Royalty	777	777	777	777	777
Car Park	90	93	95	98	101
Recovery of Charges	247	249	252	254	257
Advertising	105	110	116	122	128
Other Income	155	155	155	155	155
TOTAL	2,600	2,610	2,621	2,632	2,644
TOTAL INCOME	19,479	19,970	20,466	20,975	21,479
<u>EXPENDITURE</u>					
I.A.L Contract	1,440	1,440	1,440	1,440	1,440
Cleaning Contracts	394	394	394	394	394
Depreciation	5,568	5,568	5,568	5,568	5,568
Maintenance	787	787	787	787	787
Manpower	5,992	6,232	6,481	6,740	7,010
Overtime	350	300	300	300	300
Training	250	200	150	150	150
Conferences and Missions	156	156	156	156	156
Guest Entertainment	47	47	47	47	47
Telephone, Tlx, Post	190	190	190	190	190
Electricity-Variable	920	920	920	920	920
Communication equipment. Lease	140	140	140	140	140
Staff Transport	50	50	50	50	50
Insurance	150	150	150	150	150
Consumables	100	100	100	100	100
Doubtful Account Expenses	10	10			
Employees Benefit Expenses	300	312	324	337	350
Other Services	61	61	61	61	61
TOTAL EXPENDITURE	16,905	17,056	17,258	17,530	17,813
NET PROFIT / (LOSS)	2,574	2,914	3,208	3,445	3,666
<u>APPROPRIATIONS</u>					
Transfer to Statutory Reserve	257	291	321	345	367
Dividend	644	729	802	861	916
Retain Earning	1,673	1,894	2,085	2,239	2,383
TOTAL	2,574	2,914	3,208	3,445	3,666

Table 4.18 indicates the following:

1. Landing and parking charge

While altering landing and parking charges, two important points should be kept in mind. First, increase total revenue and thereby profit. Second, avoid business loss (loss customer-airline). We gave priority to the second aspect to achieve the first.

In determining landing and parking prices we ignore the marginal cost pricing method for two important reasons:

1. Higher prices due to higher cost means the customer may not buy the commodity, however in this case the airport may not be used by the airlines. This would eventually result in business loss. This is shown in Figures 4.20 and 4.21. These two figures represent the marginal average cost pricing method.

FIGURE 4.20

Traditional Average Cost Pricing in Off Period

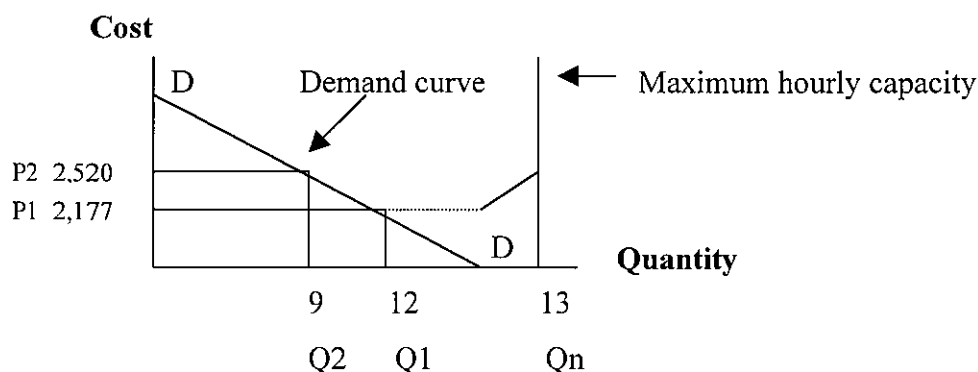
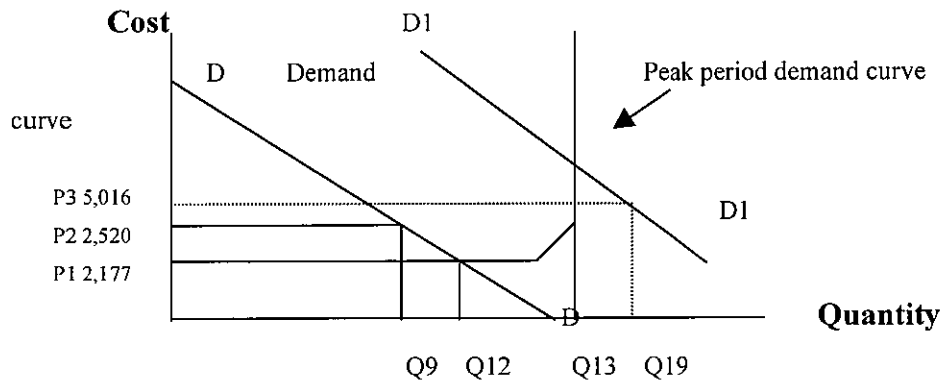


FIGURE 4.21
Marginal Average Cost Pricing in Peak Period



According to Figure 4.20, BIA, in the off period has plenty of runway capacity at all times of the day. It is designed with 7 airbridges and 5 aprons. The off period movements per hour is 1–12 aircraft. The operating cost per air transport movement is shown on the vertical scale and the average number of movements per hour is shown on the horizontal scale. The point Q_n represents the maximum of 13 movements per hour at the existing capacity. The demand curve shown by the diagonal line (D-D) is well within capacity. The average cost is at BD 181 per aircraft and at BD 2,177 for 12 aircraft at P1.

The second stage in Figure 4.21 is when aircraft traffic builds up to 19 aircraft per hour, which is higher than the existing runway capacity, especially on Mondays, Wednesdays, Thursdays and Fridays between 0800 – 1200 a.m. and 1800-2400 p.m. total

average cost is at BD 5,016 for 19 aircraft at P3 due to two additional airbridges, improving existing baggage handling facilities and building a multi storey car park, which are needed for peak hours. Therefore cost per aircraft will increase to BD 264 which is considered a high cost. Demand curve D1 – D1 will be over capacity level at 19 aircraft i.e.Q19.

2. The drawback to the proposal of privatizing Bahrain's airport, which comes under the CAA, is that unlike in many countries, Bahrain has only one airport. This is the biggest handicap in privatization which is unlikely to adopt the new pricing structure based on marginal cost, as we are not in a position to follow marginal cost pricing policy strictly, because it would greatly increase the existing prices of landing and parking tremendously and be higher than other GCC airport charges².

By considering the above limitations, and in order to maximize the revenue we gave top priority to "Aircraft weight" as the existing system in four options, which is summarized as follows:

² Refer to the Manual of Airport and Air Navigation Facility Tariffs, Published by International Civil Aviation Organization, Edition 1999, and Doc 7100.

Option One

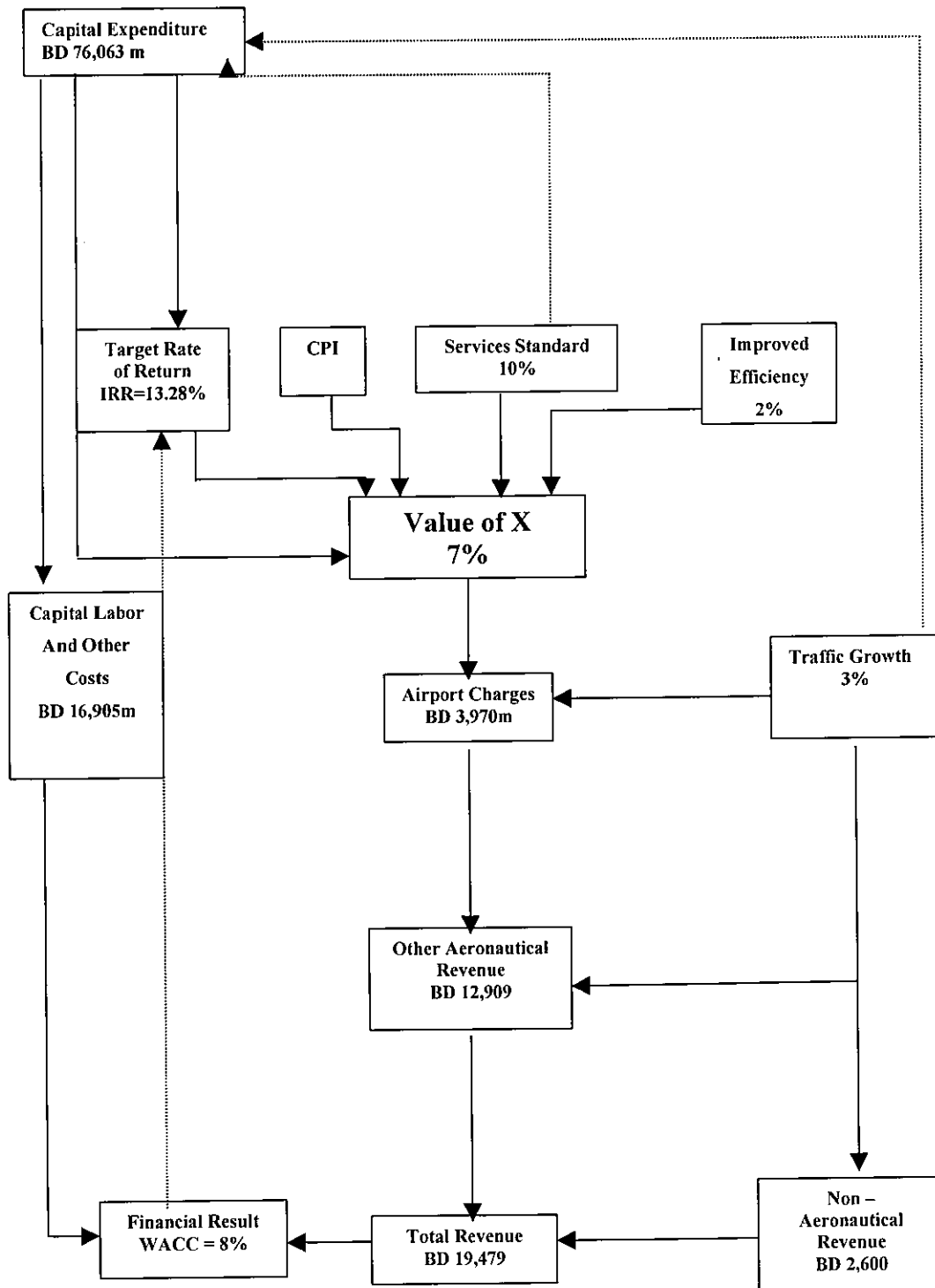
No change of the existing system.

Weight in Kg	Price in BD
Up to 7,000	7.000 flat rate
7,001 up to 136,000	1.400 per 1,000 Kg or part thereof.
Above 136,000	1.500 per 1,000 Kg or part thereof

Option Two

Figure 4.22 applying price cap formula $CPI - X$, to calculate the percentage increase or decrease in aeronautical charges (landing, parking and departure passenger tax) by achieving an adequate rate of return on airport net assets.

FIGURE 4.22
Price Cap Formula Calculation



Option Three

Aircraft weight (Kg)	Price in BD
Up to 7,000	7.000 flat rate
7,001 to 50,000	1.400 per 1,000 Kg or part thereof
50,001 to 100,000	1.600 per 1,000 Kg or part thereof
100,001 to 150,000	1.700 per 1,000 Kg or part thereof
Above 150,000	1.800 per 1,000 Kg or part thereof

Surcharge of 10% on normal charges for any aircraft landing during peak time. Where the peak time is between 0800 – 1200 a.m. and 1800 – 2400 p.m.

Option Four

Aircraft weight (Kg)	Price in BD
Up to 7,000	7.000 flat rate
7,001 to 50,000	1.500 per 1,000 Kg or part thereof
50,001 to 100,000	1.700 per 1,000 Kg or part thereof
100,001 to 150,000	1.800 per 1,000 Kg or part thereof
Above 150,000	1.900 per 1,000 Kg or part thereof

Surcharge of 10% on normal charges for the aircraft landing during peak time. Where the peak time is between 0800 – 1200 a.m. and 1800 – 2400 p.m.

Option Two analysis

The determination of CPI-X is as follows:

1. Capital expenditure

	BD'000
Net value of fixed assets on 31 st Dec 1998	64,528
Depreciation for 1999	<u>3,865</u>
Net value of fixed assets as 1st Jan 2000	60,663
Cost of new projects	<u>15,400</u>
Total capital expenditure	76,063

2. Target Rate of Return

In order to determine the target rate of return, first we need to calculate Weighted Average Cost of Capital) WACC. Explained in chapter 3.

$$WACC = W_d K_d (1-T) + W_p K_p + W_s (K_e).$$

$$WACC = 0 + 0 + 10 (.8\%)$$

$$WACC = 8\%$$

$$NPV = \sum_{t=0}^n \frac{CF_t}{(1+k)^t}.$$

<u>Years</u>	CF (Capital Expenditure)= BD (76,063)
1	Cash inflow = BD 7,642
2	Cash inflow = BD 15,524
3	Cash inflow = BD 23,619
4	Cash inflow = BD 31,880
5	Cash inflow = BD 40,312
	WACC = 8%

$$NPV = \text{BD } 13,940$$

$$IRR = 13.28\% = \text{Minimum target rate of return.}$$

3. Services standard

According to CAA's half year airport facility survey for 1997 and 1998, service standard will improve by 10% for the next ten years.

4. Improved efficiency

According to CAA's half year airport facility survey for 1997 and 1998, airport efficiency will improve by 2% for the next ten years.

5. Traffic growth

It was predicted to be 3% p.a. (This is shown in appendix 2).

Table 4.18 shows clearly the following components:

6. Capital labor and other cost

7. Airport charges

8. Aeronautical revenue

9. Non aeronautical revenue

10. Total revenue

Accumulation of aeronautical and non-aeronautical revenue

11. Financial result

Net profit for the year 2000 = BD2,574

WACC = 8%

12. Value of X:

Existing efficiency = Net Profit of 1998 / Total expenditure 1998

$$\begin{aligned} &= \text{BD } (745,000) / \text{BD } 14,034,000 \\ &= - 5\% \end{aligned}$$

Improvement of service standard = 10%

Improvement of efficiency = 2%

Value of X = 10% + 2% + (-5%) = 7%

According to the above, X is determined at 7%, therefore, landing and parking charges in each of the five years starting 1st Jan 2000 should be fixed at a level which is equivalent to CPI – 7%. This would still enable a new airport authority to achieve an internal rate of return on its assets which would average 13.28% over the five year period.

Options Three and Four analysis

1. We have not altered the price structure of smaller aircraft as the revenue is very marginal (0.27% of total landing and parking revenue) and they contribute only 6.1% of total movement This is shown in Table 4.19.
2. The weights of aircraft are reclassified and the class intervals have been increased in line with other international airports particularly UAE, UK and USA.

TABLE 4.19**Landing and Parking Revenue Under Existing System**

	Up to 7,000 kg	7,001 to 136,000 kg	Over 136,000 kg	Total
No. of landing	1,430	13,812	8,142	23,385
% share	6.1%	59.0%	34.9%	100%
Revenue BD	10,010	1,051,326	1,948,664	3,010,000
% share	0.4%	34.9%	64.7%	100%

Source: CAA statistic annual report of 1998

3. The class-intervals of the aircraft have been increased with the marginal increase in the charges for each class interval by adopting sensitivity analysis , which can generate larger revenues without losing business . Refer to appendix 3.
4. We have retained the first two existing charge structures (BD 7.000 and BD1.400) for the first two class intervals for option three.
5. By and large one income is from 7,001 Kg to 136,000 Kg (34.9% of total income and 59% of total landing movements). And over 136,000 Kg (64.7% of total income and 34.9% of total movements). By keeping these in mind, we have converted these two classes into four classes. This is shown in Tables 4.19, 4.20 and 4.21.

6. In each of the above four classes, we have increased the charges minimally, following unusual practice. It has increased by 100 fills for all categories except weights between 50,001 Kg to 100,000 Kg categories where it has been increased by 200 fills for option three and by 300 fills for option four, as shown in Tables 4.20 and 4.21. This is because total landings in that category is more than 50%. As shown in appendix 3. This means there is good scope for increasing revenue from these categories under both options.

TABLE 4.20
Landing and Parking Revenues under Option Three

	Up to 7,000 kg	7,001 to 50,000 kg	50,001 to 100,000 kg	100,001 to 150,000 kg	Over 150,000 kg	Total
No. of landing	1,430	2,432	11,243	777	7,502	23,384
% share	6.1%	10.4%	48.0%	3.3%	32.2%	100%
Revenue BD	10,010	38,689	1,472,823	187,177	2,533,239	4,241,738
% share	0.23%	0.97%	34.7%	4.4%	59.7%	100%

Source: CAA statistic annual report of 1998

TABLE 4.21**Landing and Parking Revenues under Option Four**

	Up to 7,000 kg	7,001 to 50,000 kg	50,001 to 100,000 kg	100,001 to 150,000 kg	Over 150,000 kg	Total
No. of landing	1,430	2,432	11,243	777	7,502	23,384
% share	6.1%	10.4%	48.0%	3.3%	32.2%	100%
Revenue BD	10,010	41,453	1,564,874	198,187	2,673,974	4,488,498
% share	0.23%	0.97%	34.8%	4.4%	59.6%	100%

Source: CAA statistic annual report of 1998

At present, revenue from weight categories 7,001 Kg to 136,000 Kg, based on option one, is BD 1,352,243.200. When we apply the new price structure, total revenue increases by 23.3% under option three and by 31% under option four, as shown in Table 4.22. This justifies the marginal increase in prices, in these categories under both options. Any other type of price increase would more or less, have a large negative impact upon business.

TABLE 4.22

**Increase in Revenue/Change in Revenue under 7,001 to 136,000 kg Among Existing
and Revised Price Structure**

Items in BD	7,001 to 50,000 kg	50,001 to 100,000 kg	100,001 to 136,000 kg	Total
Option three	38,689	1,472,822	157,021	1,668,532
Option four	41,453	1,564,877	166,257	1,772,587
Revenue from existing structure (7,001-136,000 kg)	-	-	-	1,352,243
% increase option three	-	-	-	23.3%
% increase option four	-	-	-	31.3%

On the whole, when we follow option three, the total landing revenue increased by 40.9% (without adding peak period charges) and by 49.1% under option four. This further increases by 44.9% and 54.1% when we include peak period charges of these two options, see appendix 3. In our income statement, predicted analysis, we have chosen option three by considering our interest. That is, the price rise is still minimal in option three than four. Table 4.23 shows that the class interval remains the same.

TABLE 4.23
Total Revenue under Different Options

Items	Amount BD m	Percentage increase from existing charges
Existing system	3,010,000	-
Option three	4,241,937	40.9%
Option four	4,488,498	49.1%

Whenever we touched the issue of cost-based pricing “we kept in mind the only one airport” in Bahrain. This made it difficult for us to follow an international standard. For instance, we follow “peak” and “off peak” period pricing for landing charges. In the case of Bahrain International Airport the peak period on the whole is small considering the number of landings during that period. Therefore, we are unable to follow a separate pricing structure for this period. Instead, we propose an additional 10% on normal charges, for aircraft landing during peak

periods (where currently the peak time is between 0800 – 1200 a.m. and 1800 – 2400 p.m.) under both options. This 10% is again based on many international airport surcharge structure.

On the other hand, parking charges options are as follows:

Option One

Continue on the existing system:

Aircraft weight in (Kg)	Charge per 24 hours or part thereof in BD
Up to 25,000	5.000 flat rate
25,001 and over	0.200 per 1,000 Kg or part thereof
First two hours free of charge.	

Option Two

Basis: Length X Span of the aircraft in square meters.

Charge per 24 hours or part thereof	
Commencing 2 hours after landing (BD)	
Up 40 square meters	7.000 flat rate
40 square meters	0.300 per each 10 square meters
and above	
First two hours free of charge.	

Examples on light, medium and heavy aircraft as follows:

TABLE 4.24

Aircraft Parking Charges Comparison under Option Two

Aircraft	Weight in Kg	Length in m²	Wing span in m²	Existing charge per 24 hour in BD	New charge per 24 hour in BD
206B3	1,451	11.82	1.92	5.000	7.000
A320	75,500	37.57	33.91	15.100	38.220
B767-300	156,490	54.9	47.6	32.300	78.400

Option Three

Basis: Maximum Authorized Take-Off Weight.

Aircraft weight in (Kg) Charge per 24 hours or part thereof in BD

Up to 25,000 5.500 flat rate

25,001 and over 0.220 per 1,000 Kg or part thereof

First two hours free of charge.

Examples on light, medium and heavy aircraft as follows:

TABLE 4.25

Aircraft Parking Charges Comparison under Option Three

Aircraft	Weight in Kg	Existing charge per 24 hour in BD	New charge per 24 hour in BD
206B3	1,451	5.000	5.500
A320	75,500	15.100	16.610
B767-300	156,490	32.300	34.430

Option Four

First two hours free, thereafter, 75% of the applicable landing charges (option three of landing charges) for aircraft up to 7,000 kg and 20% for 7,001 and over per 24 hours.

Examples on light, medium and heavy aircraft as follows:

TABLE 4.26

Aircraft Parking Charges Comparison under Option Four

Aircraft	Weight in Kg	Existing charge per 24 hour in BD	New charge per 24 hour in BD
206B3	1,451	5.000	1.400
A320	75,500	15.100	24.160
B767-300	156,490	32.300	56.340

According to the above options and by analyzing parking revenue, it is insignificant to increase the revenue from this area, therefore we propose three options which are based on international airports practicing policies.

The first proposal under option two is to take length times wing span square meter of the aircraft rather than MTOW to determine parking charges. This appears to be a plausible norm, as the area occupied by the aircraft are not exactly in proportionate to MTOW, refer to appendix 3. Aircraft of higher weights sometimes occupy less area and vice versa. To avoid this problem we have taken only the area occupied by the

aircraft. Secondly many international airports also follow the same principles. So we propose option two over the other options for parking charges as shown in Table 4.24. Here again, the price imposed is negligible. It is unable to quantify the expected revenue from all parking revenue due to non-availability of variable and fixed costs of aircraft. However most of the scheduled aircraft are leaving the apron within two hours.

The second proposal under option three parking charges, is based on the existing MTOW, with the minor alteration in charges, see Table 4.25. Finally, option four is to impose 75% of aircraft weight up to 7,000 kg of the applicable landing charges and 20% of aircraft above 7,000 kg per 24 hours, and this option is followed by some international airports, see Table 4.25. Among all these, we propose option two as being the most appropriate one to follow.

Overall, the projected landing and parking charges in the income statement is based on option three for landing charges and projected aircraft movements of 3% per year.

2. Over flying Charges

Over flying charges are divided into standard charges and surcharges, where standard charges are based on aircraft which take-off from or land at Bahrain Flight Information Region (FIR). However, the surcharge is applied to aircraft which do not take-off or land at Bahrain FIR. Our proposal for increasing the existing over flying charges comes under the following options:

Option One

No change on the existing system:

Weight in Kg	Price in BD
Up to 40,000	12.600
40,001 – 80,000	18.900
80,001 – 120,000	25.200
120,001 – 200,000	31.500
200,001 – 300,000	37.800
300,000 up wards	42.000

The standard charges will be based on the above charges for each aircraft landing or take-off in the FIR. Surcharges will be 50% on the above charge for each aircraft which does not involve a take-off from or landing in the FIR.

Option Two

Minimize the current MTOW categories from 6 to 3 categories:

Weight in Kg	Price in BD
Up to 60,000	25
60,001 to 300,000	45
Above 300,000	60

The charge will increase by 50% as a surcharge. And the above charge times 2 for each aircraft landed and take-off at FIR.

Option Three

Develop a flat rate.

Weight in Kg	Price in BD
Up to 120,000	40
Above 120,000	0.375 per 1,000 Kg or part thereof.

The above charge times 2 for each aircraft landed and take –off at the FIR.

The analysis and determination of the prices as follows:

1. For option two, aircraft weighting up to 60,000 Kg over flying charges increased by 32% only. This is because total movement in that category is 14% for landing and take-off and 5% only for standard revenue. It contributes 4-17% overflying movements and 1-12% only for surcharge revenue, see Tables 4.27 and 4.28.

But for aircraft between 60,000 Kg and 300,000 Kg the charges increased by 19-79%. This is because of large movements and income generated from these categories. However, charges increased by 42% only, for aircraft weighting over 300,000 Kg. This is also because of less movements and income involved in that category.

TABLE 4.27

Total Movements and Revenue from Standard Charges based on the Existing System

	Up to 40,000 Kg	40,001- 80,000 Kg	80,001- 120,000 Kg	120,001- 200,000 Kg	200,001- 300,000 Kg	Above 300,000 Kg	Total
No. of Mov.	7,148	4,897	15,950	7,881	10,909	9,384	56,169
% share	13%	9%	28%	14%	19%	17%	100%
Rev. in BD	98,576	123,247	426,628	289,101	237,514	461,693	1,636,759
% share	6%	7%	26%	18%	15%	28%	100%

Source: CAA statistic Annual report 1998

TABLE 4.28

Total Movements and Revenue from Surcharge based on the Existing System

	Up to 40,000 Kg	40,001- 80,000 Kg	80,001- 120,000 Kg	120,001- 200,000 Kg	200,001- 300,000 Kg	Above 300,000 Kg	Total
No. of Mov.	3,396	14,556	3,648	25,980	21,456	15,168	84,204
% share	4%	17%	5%	31%	25%	18%	100%
Rev. in BD	61,324	493,970	113,400	1,425,854	1,154,097	955,584	4,204,229
% share	1%	12%	3%	34%	27%	23%	100%

Source: CAA statistic Annual report 1998

When we apply option two, standard revenue will increase by 43% and by 41% for surcharges, see Table 4.29 and 4.30 and Appendix 3.

TABLE 4.29

**Total Revenue Generated from Standard Charges based on
Option Two**

	Up to 60,000 Kg	60,001-300,000 Kg	Above 300,000 Kg	Total
No. of Mov.	7,858	38,927	9,384	56,169
% share	14%	69%	17%	100%
Rev. in BD				
- Actual	98,028	1,524,787	13,944	1,636,759
- New	176,375	1,641,730	19,920	1,838,025
% share	9%	90%	1%	100%

TABLE 4.30

Total Revenue Generated from Surcharge based on Option Two

	Up to 60,000 Kg	60,001- 300,000 Kg	Above 300,000 Kg	Total
No. of Mov.	3,936	65,100	15,168	84,204
% share	5%	77%	18%	100%
Reve. in BD				
- Actual	79,493	3,169,152	955,584	4,204,229
- New	147,600	4,394,250	1,365,120	5,906,970
% share	2%	75%	23%	100%

- For option three, over flying charges are calculated at a fixed rate of BD 0.375 for aircraft above 120,000 Kg, because the same formula resulted in a big loss of income as this category contributes 53% of

total landing and take-off movements, see Tables 4.31 and 4.32, and appendix 3.

TABLE 4.31
Total Revenue Generated from Standard Charges based on
Option Three

	Up to 120,000 Kg	Above 120,000 Kg	Total
No. of Mov.	29,616	26,553	56,169
% share	53%	47%	100%
Rev. in BD			
- Actual	641,452	995,307	1,636,759
- New	876,274	1,456,483	2,332,757
% share	38%	62%	100%

TABLE 4.32
Total Revenue Generated from Surcharge based on
Option Three

	Up to 120,000 Kg	Above 120,000 Kg	Total
No. of Mov.	22,152	62,052	84,204
% share	26%	74%	100%
Rev. in BD			
- Actual	635,153	3,569,076	4,204,229
- New	885,600	5,387,778	6,273,378
% share	15%	85%	100%

Option three, price structure will increase standard revenue by 43% and surcharge by 57%.

3. At present, total over flying charges based on option one is BD 5.8 million. When we apply the new price structure, total revenue will increase by 41% for option two and by 48% for option three.

In our income statement analysis we have chosen option three , as shown in Table 4.33.

TABLE 4.33
Comparison of Overall Options

BD m	Standard revenue	Surcharge revenue	Total
Option One	1.6	4.2	5.8
Option Two	2.3	5.9	8.2
Option Three	2.3	6.3	8.6

3. Passenger Tax (passenger services charges)

Currently passenger departure tax of BD 3.000 is levied on each departing passenger over two years of age and in order to improve CAA revenue with improving the existing facilities and services, we increased this tax to BD 5.000 per departing passenger, to be in line with other GCC countries, see Table 4.34. And the amount included in the income statement is based on the projected number of departing passenger at a rate 3% per year.

TABLE 4.34
GCC Airport Departing Fee Comparison

GCC AIRPORTS	FEE IN BD
Bahrain	3.000 over 2 years of age
Kuwait	2.480 over 12 years of age
Oman	4.900 over 12 years of age
Qatar	2.070 over 12 years of age
Saudi Arabia	Proposed SR.50 not implemented yet.
United Arab Emirates	No fee.

4. Rents

Small increment is expected.

5. BAS Concession

Currently the amount of BAS concession is fixed at 3% of the company gross revenue plus fixed rent of the designated area used by the company. However, the amount included in the income statement is based on the projected BAS gross revenue for the period (2000- 2004) plus the same fixed rent.

6. Duty Free Royalty

Currently the amount of duty free royalty is fixed at 50% of the company's net profit plus fixed rent of the designated area used by the company. However, the amount included in the income statement is based on the projected duty free net profit for the period (2000- 2004) plus the same fixed rent.

7. Car Park

CAA objective is to make Bahrain International Airport one of the major airport hubs in the world by continuously improving the existing facilities. Therefore, in order to meet long term/Saudi passenger requirements, CAA announced it would improve the existing car park to a multi storey car park in the near future at a cost of BD 3.9 million. Due to identifying a need for additional facilities, the amount is expected

to increase to BD 90,000 during year 2000 and thereafter by 3% as the arriving passenger forecasted growth.

8. Advertising

In 2000, by better management, the amount is expected to be BD 105,000 and thereafter 5% increment is expected from 2001.

9. Other Income

Average from 1995-1998. 1994 is an odd figure and hence omitted for the average.

10. I.A.L Contract

The amount is per the contract.

11. Depreciation

The calculation of depreciation is as follows:

	BD'000	BD'000
Depreciation for the year 1998		3,865

Cost of new projects:

a. Multistory car park

Cost	3,900	
Life 10 years		
Depreciation		390

b. Two new air bridges

Cost	5,000	
Life of 10 years		
Depreciation		500

c. New baggage handling facility

Cost	6,500	
Life of 8 years		
Depreciation		813

Total	15,400	5,568
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However, the depreciation may be changed according to the addition of new assets or if any of the assets is fully depreciated during the period.

12. Manpower

Only 4% increment is expected because of effective management.

13. Overtime

The amount is expected to be BD 350,000 in the first year and subsequently it will be reduced by better control during the first two years.

14. Training

It is expected to be higher in the first two years.

15. Electricity – Variable

Due to expansion 10% is added to the average of the previous years excluding 1995.

16. Insurance

Amount will be increased on account of new projects.

17. Consumables

Only small increment is expected.

18. Doubtful Account Expenses

Due to the change in management some extraordinary items are expected for the first two years.

19. Employees Benefit Expenses

It is assumed that for the first year it will be BD 300,000 and after that it will be increased by 4%.

20. Transfer to Statutory Reserve

As required by Bahrain Commercial Companies Law, 1975 (as amended) and Company's Memorandum and Articles of Association, 10% of the net profit is transferred to statutory reserve.

21. Dividend

Dividend is restricted to 25% of the net profit for the year in compliance with the special covenants prescribed by Faysal Islamic Bank concerning newly privatized companies.

22. Retained Earning

65% of net profit.

Other revenues and expenses accounts calculated by using averages of 1995 to 1998.

4.3.2.2 Balance Sheet

CAA Balance sheet as 31st December 1998 is as follows:

TABLE 4.35

Audited Balance Sheet Comparison

PARTICULARS	1998 BD'000	Unaudited – 1997 BD'000
<u>ASSETS EMPLOYED</u>		
PROPERTY, PLANT AND EQUIPMENT	64,528,242	66,090,000
CURRENT ASSETS		
Inventories	349,996	201,555
Accounts receivable	4,744,408	6,032,257
CURRENT LIABILITIES		
Accounts payable and accruals	1,371,464	1,437,607
NET CURRENT ASSETS	3,722,940	4,796,205
TOTAL	68,251,182	70,886,205
<u>FUNDS EMPLOYED</u>		
EQUITY		
Contribution from Government	80,580,384	82,628,577
Accumulated deficit	(12,487,119)	(11,742,372)
NON CURRENT LIABILITY		
Employees terminal benefits	157,917	-
TOTAL	68,251,182	70,886,205

Source: CAA Audited Financial Report 1998

The projected balance sheet as on 31st Dec 1999 is as follows:

TABLE 4.36

Projected Balance Sheet for Year 1999

PARTICULARS	1999 BD'000
<u>ASSETS EMPLOYED</u>	
FIXED ASSETS	60,663,000
CURRENT ASSETS	
Inventories	350,000
Accounts receivable	5,083,000
CURRENT LIABILITIES	
Accounts payable and accruals	1,371,000
NET CURRENT ASSETS	4,062,000
TOTAL	64,725,000
<u>FUNDS EMPLOYED</u>	
EQUITY	
Contribution from Government	64,500,000
NON CURRENT LIABILITY	
Employees terminal benefits	225,000
TOTAL	64,725,000

However the projected balance sheet as on 31st December for the period 2000-2004 is as follows:

TABLE 4.37
CAA Forecasted Balance Sheet

PARTICULARS	2000	2001	2002	2003	2004
ASSETS EMPLOYED					
FIXED ASSETS	70,495,000	64,927,000	59,359,000	53,791,000	48,223,000
CURRENT ASSETS					
Cash and Bank	7,642,000	15,524,000	23,619,000	31,880,000	40,312,000
Inventories	400,000	440,000	484,000	532,000	586,000
Accounts receivable and other current assets	5,844,000	5,991,000	6,140,000	6,293,000	6,444,000
	13,886,000	21,955,000	30,243,000	38,705,000	47,342,000
CURRENT LIABILITIES					
Accounts payable and accruals	1,500,000	1,575,000	1,654,000	1,736,000	1,824,000
Dividend payable	644,000	729,000	802,000	861,000	916,000
	2,144,000	2,304,000	2,456,000	2,597,000	2,740,000
NET CURRENT ASSETS	11,742,000	19,651,000	27,787,000	36,108,000	44,601,000
TOTAL	82,237,000	84,578,000	87,146,000	89,898,000	92,823,000
FUNDS EMPLOYED					
Equity share capital	80,000,000	80,000,000	80,000,000	80,000,000	80,000,000
Statutory reserve	257,000	548,000	869,000	1,214,000	1,580,000
Retained earning	1,673,000	3,567,000	5,652,000	7,891,000	10,274,000
NON CURRENT LIABILITY					
Employees terminal benefits	307,000	463,000	625,000	793,000	969,000
TOTAL	82,237,000	84,578,000	87,146,000	89,898,000	92,823,000

1. Fixed Assets

Fixed assets is determined as follows:

	BD'000
Net value as on 31 st Dec 1998	64,528,000
Depreciation for 1999	<u>3,865,000</u>
Net value as on 1 st Jan 2000	60,663,000
Cost of new projects	<u>15,400,000</u>
	76,063,000
Depreciation for 2000	<u>5,568,000</u>
Total fixed assets	<u>70,495,000</u>

It is assumed that there will not be any addition or deletion during 2001 to 2004 except for the above mentioned above.

2. Cash and Bank

Cash flow statement is determined as follows:

TABLE 4.38
CAA Forecasted Cash Flow

	2000	2001	2002	2003	2004
Cash Flow From Operating Activities					
Net Profit	2,574,000	2,914,000	3,208,000	3,445,000	3,666,000
Non Cash Expenditure-Depreciation	5,568,000	5,568,000	5,568,000	5,568,000	5,568,000
Increase in Current Liabilities	129,000	75,000	79,000	82,000	88,000
Increase in Non Current Liabilities	82,000	156,000	162,000	169,000	175,000
Increase in Inventories	(50,000)	(40,000)	(44,000)	(48,000)	(54,000)
Increase in Accounts Receivables	(761,000)	(147,000)	(149,000)	(153,000)	(151,000)
	7,542,000	8,526,000	8,824,000	9,064,000	9,293,000
Cash Flow From Investment Activities					
Cost of New Project	(15,400,000)	0	0	0	0
Cash Flow From Financing Activities					
Issue of Shares	15,500,000				
Payment of Dividend		(644,000)	(729,000)	(802,000)	(861,000)
	15,500,000	(644,000)	(729,000)	(802,000)	(861,000)
Increase / (decrease) in cash equivalence	7,642,000	7,882,000	8,095,000	8,262,000	8,432,000
Cash and Cash Equivalence at the Beginning of the Year	0	7,642,000	15,524,000	23,619,000	31,880,000
Closing Balance	7,642,000	15,524,000	23,619,000	31,880,000	40,312,000

Cash flow data analysis is as follows:

1. Issue of shares

Value of shares to be issued at share price of BD 1.000 per share which is equivalent to the cost of the new projects.

2. Cash and cash equivalencies at the beginning of the year

At present the cash and bank balance is merged with Government account, the opening balance as on 1st Jan 2000 is taken as nil.

Other cash flow accounts are based on the different between current year and previous year.

3. Inventories

Due to additional investment and new projects, 10% increase is expected.

4. Account Receivable and Other Current Assets

Currently the receivables are approximately 35% of total revenue. Because of better control, are expected to be 30% of total income.

5. Account Payable and Accruals

In the first year it is taken as balancing figure and after that a 5% increment is expected.

6. Equity Share Capital

Share capital is determined as follows:

	BD'000
Government account as on 31 st Dec 1999	64,500,000
Additional capital required for new projects	<u>15,500,000</u>
Total share capital	<u>80,000,000</u>

7. Employee Terminal Benefits

In 2000, it is expected to be BD 307,000 which was not accounted on accrual basis for the previous years and afterwards it is expected to be increased by 50% of terminal benefit.

4.3.3 Overall conclusion

The idea of privatizing the CAA is to be considered for improving the revenue, meeting the financial requirements for new projects, as well as for the efficient and effective functioning of the CAA. Therefore, in order to avoid losses, and to improve the efficiency of CAA, it is right to create a separate authority for monitoring the functions of the CAA, which can be done either by creating a separate company and appointing a Board of Directors for controlling the affairs of the company or by creating an authority directly under the government and appointing one Chief Executive Officer. Either way, by better management, the new authority or company will take certain actions to maximize revenue and to recover their costs.

The new company can be created with government and with private participation and the extent of the privatization has to be decided by the government after considering the requirement of funds for further development and the control of the management of the CAA.

The financial impact of CAA privatization depends on the method and quantum of privatization. The government can issue shares to the public only for the purpose of meeting funds for further development. Alternatively, it can be done by allowing big financial institutions or companies to contribute to the capital on a joint venture basis or the government can issue security bonds bearing fixed interest rates which will be paid every year. The value of the bonds would be repayable after a specified period, say 5 years, and in that case, interest will have to be paid annually, irrespective of whether the establishment is achieving a profit or not.

For financial analysis, the study has gone into details of forming a separate company as an example of privatizing CAA. The same analysis can be done for the other options before deciding the best option.

Based on different options to maximize aeronautical revenue, the top priority was given to aircraft weight, and by increasing the class intervals to six categories instead of three categories. Also, marginal increases in charges for each class interval for landing charges, will increase landing revenue by 40.9%, and minimizing the current over flying charges from six categories to two categories will increase the over flying revenue by 48%.

On the other hand, the airport authority can reduce or increase aeronautical charges for the coming five years starting 1st year 2000 by applying price cap formula (CPI – 7%), which will result in efficient pricing, as this formula takes into account all possible costs being presently incurred and also the cost and payback of new investment proposals.

However, it is clear from the cash flow statement that if the airport can earn profit according to the projected profit and loss account, there will be sufficient funds for the project and it is a viable one. Even without issuing the shares to the public, the new project can be completed within two or three years provided the estimated profit is realized.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

The objective of this research is to establish the possibility of the privatization of the Civil Aviation Affairs and the Bahrain International Airport operations and also to understand how the performance of the airport could be improved. It has arrived at the conclusion that privatization can bring greater profitability by achieving operational efficiency and responding to market opportunities, but this does not mean that the existing CAA which comes under Government is inefficient. The main advantage of privatization is that it will be able to provide adequate funds for airport infrastructure development and improvement and provide first class airport management services.

The DQM analysis is performed in order to measure the attractiveness level of Bahrain International Airport, and the Price Cap Formula is evolved and worked out in the thesis for the aeronautical charges, by measuring the Weighted Average Cost of Capital, Net Present Value, Internal Rate of Return, Cash Flow and traffic growth. An Input-Output ratio was also calculated which measures the airport performance and

efficiency. Based on all the calculations stated above the conclusions of this thesis are as follows:

1. Privatization has many advantages in terms of profitability, which should increase from BD 2,574 million in year 2000 to BD 3,666 million in year 2004. Service standards and efficiency should improve by 10% and 2% respectively.
2. BIA has a strong economic base with an increase of 7% on average but it has low tourism attractiveness. Generally it has a stable income stream as it depends on “business trip” and “visiting friends and relatives” passengers but it is unlikely to achieve spectacular growth.
3. As the traffic increases, the cost of handling each passenger goes down which was proved and tested by considering the variables such as projected growth in traffic by 3%, levels of capital investments of BD 76,063 million in services and acceptable target rate of return at a minimum of 13.28% on net assets. Thus the “X” at 7% when calculated helps to achieve an adequate rate of return on assets, without compromising on efficiency.

4. Performance indicators must be used as a management tool to analyze and monitor past and present performance, to ensure that the various inputs and resources are employed efficiently and effectively. The WLU has been increased from 4.4 million units in 1995 to 4.7 million units in 1998, which indicates the best use of resources, higher output with reduced input. The overall cost performance in terms of total cost per WLU, operating cost per WLU, and labour cost per WLU, has been increasing constantly except for 1998. However, CAA has economies of scale, because cost per unit decreased as traffic throughput increases. CAA can achieve economies of scale in terms of manpower cost by allocating certain budget of manpower cost per each month of total CAA budget of any year.
5. CAA is also making the best utilization of all employees, as labour productivity is on the increase but aeronautical revenue is decreasing which will be taken care of in privatization. In essence privatization will reduce all the costs stated above, to generate more profits and reduce inefficiency.

6. In the thesis, a detailed study was done on the methods of maximizing revenue and top priority was given to aircraft weight. Based on different options, it was found that NPV of the additional expenditure to provide additional facilities after privatization, will be positive with BD 13,940 million. The IRR is 13.28%, which is excellent and the WACC is only 8% which is the accepted cost of capital on any borrowing.

Thus, privatization of the CAA and airport will be much more beneficial and profitable and the areas where increases must be considered after privatizing are rents, car park charges, commercial revenue and advertising, as other means to supplement the aeronautical revenue.

5.2 RECOMMENDATIONS

The primary recommendation of this research is that the CAA must be privatized to make it more profitable and to be run efficiently. This can be done by forming a company and appointing a Board of Directors for controlling the affairs or by creating a separate authority directly under the government and appointing one Chief Executive Officer at the helm of affairs for monitoring the functions of the CAA. The new company can be created with the government and with private participation and the extent of the privatization has to be decided by the government after considering requirement of funds for further development and the control on the management of the CAA. Alternatively, the authority can be created by allowing big financial institution or companies to contribute to the capital on a joint venture basis or the government can issue security bonds bearing fixed interest rate which has to be paid every years. The value of the bonds would be payable after a specified period, say 5 years. In that case interest has to be paid irrespective of whether the establishment is running at profit or not.

This is required due to the fact that the Cash Flow statement shows an increasing inflow from operations from 2000 to 2004 of about 427.5%. The total income also shows an increasing trend in the future years.

The recommendation to privatize is built on an assumption that increases to be made in the over flying charges, by minimizing the current over flying charges into two categories, instead of six categories, increasing the landing charges by increasing the class intervals into six categories instead of three categories and converting the parking charges to be based on the area occupied by aircraft, instead of the weight of the aircraft, differential landing charges for the peak and off peak periods, all to be in line with other GCC countries.

The future aeronautical charges for the next 5 years can be increased or decreased by $(CPI - 7\%)$ which has been worked out in the thesis, as this will improve the revenue.

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Home page:<http://www.bts.gov/ntl/DOCS/rc9682t.html>

APPENDICIES

APPENDIX 1

Bahrain International Airport Tourism Attractiveness
What is the chief purpose of your trip today ?

No of passengers	Business	Tourist	Visit	Others	No of passengers	Business	Tourist	Visit	Others	No of passengers	Business	Tourist	Visit	Others
1	1	0	0	0	51	1	0	0	0	101	1	0	0	0
2	1	0	0	0	52	1	0	0	0	102	1	0	0	0
3	1	0	0	0	53	1	0	0	0	103	1	0	0	0
4	1	0	0	0	54	1	0	0	0	104	1	0	0	0
5	1	0	0	0	55	1	0	0	0	105	1	0	0	0
6	1	0	0	0	56	1	0	0	0	106	1	0	0	0
7	1	0	0	0	57	1	0	0	0	107	1	0	0	0
8	1	0	0	0	58	1	0	0	0	108	1	0	0	0
9	1	0	0	0	59	1	0	0	0	109	1	0	0	0
10	1	0	0	0	60	1	0	0	0	110	1	0	0	0
11	1	0	0	0	61	1	0	0	0	111	1	0	0	0
12	1	0	0	0	62	1	0	0	0	112	1	0	0	0
13	1	0	0	0	63	1	0	0	0	113	1	0	0	0
14	1	0	0	0	64	1	0	0	0	114	1	0	0	0
15	1	0	0	0	65	1	0	0	0	115	1	0	0	0
16	1	0	0	0	66	1	0	0	0	116	1	0	0	0
17	1	0	0	0	67	1	0	0	0	117	1	0	0	0
18	1	0	0	0	68	1	0	0	0	118	1	0	0	0
19	1	0	0	0	69	1	0	0	0	119	1	0	0	0
20	1	0	0	0	70	1	0	0	0	120	1	0	0	0
21	1	0	0	0	71	1	0	0	0	121	1	0	0	0
22	1	0	0	0	72	1	0	0	0	122	1	0	0	0
23	1	0	0	0	73	1	0	0	0	123	1	0	0	0
24	1	0	0	0	74	1	0	0	0	124	1	0	0	0
25	1	0	0	0	75	1	0	0	0	125	1	0	0	0
26	1	0	0	0	76	1	0	0	0	126	1	0	0	0
27	1	0	0	0	77	1	0	0	0	127	1	0	0	0
28	1	0	0	0	78	1	0	0	0	128	1	0	0	0
29	1	0	0	0	79	1	0	0	0	129	1	0	0	0
30	1	0	0	0	80	1	0	0	0	130	1	0	0	0
31	1	0	0	0	81	1	0	0	0	131	1	0	0	0
32	1	0	0	0	82	1	0	0	0	132	1	0	0	0
33	1	0	0	0	83	1	0	0	0	133	1	0	0	0
34	1	0	0	0	84	1	0	0	0	134	1	0	0	0
35	1	0	0	0	85	1	0	0	0	135	1	0	0	0
36	1	0	0	0	86	1	0	0	0	136	1	0	0	0
37	1	0	0	0	87	1	0	0	0	137	1	0	0	0
38	1	0	0	0	88	1	0	0	0	138	1	0	0	0
39	1	0	0	0	89	1	0	0	0	139	1	0	0	0
40	1	0	0	0	90	1	0	0	0	140	1	0	0	0
41	1	0	0	0	91	1	0	0	0	141	1	0	0	0
42	1	0	0	0	92	1	0	0	0	142	1	0	0	0
43	1	0	0	0	93	1	0	0	0	143	1	0	0	0
44	1	0	0	0	94	1	0	0	0	144	1	0	0	0
45	1	0	0	0	95	1	0	0	0	145	1	0	0	0
46	1	0	0	0	96	1	0	0	0	146	1	0	0	0
47	1	0	0	0	97	1	0	0	0	147	1	0	0	0
48	1	0	0	0	98	1	0	0	0	148	1	0	0	0
49	1	0	0	0	99	1	0	0	0	149	1	0	0	0
50	1	0	0	0	100	1	0	0	0	150	1	0	0	0

No of passengers	Business	Tourist	Visit	Others	No of passengers	Business	Tourist	Visit	Others	No of passengers	Business	Tourist	Visit	Others
151	1	0	0	0	201	1	0	0	0	251	1	0	0	0
152	1	0	0	0	202	1	0	0	0	252	1	0	0	0
153	1	0	0	0	203	1	0	0	0	253	1	0	0	0
154	1	0	0	0	204	1	0	0	0	254	1	0	0	0
155	1	0	0	0	205	1	0	0	0	255	1	0	0	0
156	1	0	0	0	206	1	0	0	0	256	1	0	0	0
157	1	0	0	0	207	1	0	0	0	257	1	0	0	0
158	1	0	0	0	208	1	0	0	0	258	1	0	0	0
159	1	0	0	0	209	1	0	0	0	259	1	0	0	0
160	1	0	0	0	210	1	0	0	0	260	1	0	0	0
161	1	0	0	0	211	1	0	0	0	261	1	0	0	0
162	1	0	0	0	212	1	0	0	0	262	1	0	0	0
163	1	0	0	0	213	1	0	0	0	263	1	0	0	0
164	1	0	0	0	214	1	0	0	0	264	1	0	0	0
165	1	0	0	0	215	1	0	0	0	265	1	0	0	0
166	1	0	0	0	216	1	0	0	0	266	1	0	0	0
167	1	0	0	0	217	1	0	0	0	267	1	0	0	0
168	1	0	0	0	218	1	0	0	0	268	1	0	0	0
169	1	0	0	0	219	1	0	0	0	269	1	0	0	0
170	1	0	0	0	220	1	0	0	0	270	1	0	0	0
171	1	0	0	0	221	1	0	0	0	271	1	0	0	0
172	1	0	0	0	222	1	0	0	0	272	1	0	0	0
173	1	0	0	0	223	1	0	0	0	273	1	0	0	0
174	1	0	0	0	224	1	0	0	0	274	1	0	0	0
175	1	0	0	0	225	1	0	0	0	275	1	0	0	0
176	1	0	0	0	226	1	0	0	0	276	1	0	0	0
177	1	0	0	0	227	1	0	0	0	277	1	0	0	0
178	1	0	0	0	228	1	0	0	0	278	1	0	0	0
179	1	0	0	0	229	1	0	0	0	279	1	0	0	0
180	1	0	0	0	230	1	0	0	0	280	1	0	0	0
181	1	0	0	0	231	1	0	0	0	281	1	0	0	0
182	1	0	0	0	232	1	0	0	0	282	1	0	0	0
183	1	0	0	0	233	1	0	0	0	283	1	0	0	0
184	1	0	0	0	234	1	0	0	0	284	1	0	0	0
185	1	0	0	0	235	1	0	0	0	285	1	0	0	0
186	1	0	0	0	236	1	0	0	0	286	1	0	0	0
187	1	0	0	0	237	1	0	0	0	287	1	0	0	0
188	1	0	0	0	238	1	0	0	0	288	1	0	0	0
189	1	0	0	0	239	1	0	0	0	289	1	0	0	0
190	1	0	0	0	240	1	0	0	0	290	1	0	0	0
191	1	0	0	0	241	1	0	0	0	291	1	0	0	0
192	1	0	0	0	242	1	0	0	0	292	1	0	0	0
193	1	0	0	0	243	1	0	0	0	293	1	0	0	0
194	1	0	0	0	244	1	0	0	0	294	1	0	0	0
195	1	0	0	0	245	1	0	0	0	295	1	0	0	0
196	1	0	0	0	246	1	0	0	0	296	1	0	0	0
197	1	0	0	0	247	1	0	0	0	297	1	0	0	0
198	1	0	0	0	248	1	0	0	0	298	1	0	0	0
199	1	0	0	0	249	1	0	0	0	299	1	0	0	0
200	1	0	0	0	250	1	0	0	0	300	1	0	0	0

No of passengers	Business	Tourist	Visit	Others	No of passengers	Business	Tourist	Visit	Others	No of passengers	Business	Tourist	Visit	Others
301	1	0	0	0	351	1	0	0	0	401	1	0	0	0
302	1	0	0	0	352	1	0	0	0	402	1	0	0	0
303	1	0	0	0	353	1	0	0	0	403	1	0	0	0
304	1	0	0	0	354	1	0	0	0	404	1	0	0	0
305	1	0	0	0	355	1	0	0	0	405	1	0	0	0
306	1	0	0	0	356	1	0	0	0	406	1	0	0	0
307	1	0	0	0	357	1	0	0	0	407	1	0	0	0
308	1	0	0	0	358	1	0	0	0	408	1	0	0	0
309	1	0	0	0	359	1	0	0	0	409	0	1	0	0
310	1	0	0	0	360	1	0	0	0	410	0	1	0	0
311	1	0	0	0	361	1	0	0	0	411	0	1	0	0
312	1	0	0	0	362	1	0	0	0	412	0	1	0	0
313	1	0	0	0	363	1	0	0	0	413	0	1	0	0
314	1	0	0	0	364	1	0	0	0	414	0	1	0	0
315	1	0	0	0	365	1	0	0	0	415	0	1	0	0
316	1	0	0	0	366	1	0	0	0	416	0	1	0	0
317	1	0	0	0	367	1	0	0	0	417	0	1	0	0
318	1	0	0	0	368	1	0	0	0	418	0	1	0	0
319	1	0	0	0	369	1	0	0	0	419	0	1	0	0
320	1	0	0	0	370	1	0	0	0	420	0	1	0	0
321	1	0	0	0	371	1	0	0	0	421	0	1	0	0
322	1	0	0	0	372	1	0	0	0	422	0	1	0	0
323	1	0	0	0	373	1	0	0	0	423	0	1	0	0
324	1	0	0	0	374	1	0	0	0	424	0	1	0	0
325	1	0	0	0	375	1	0	0	0	425	0	1	0	0
326	1	0	0	0	376	1	0	0	0	426	0	1	0	0
327	1	0	0	0	377	1	0	0	0	427	0	1	0	0
328	1	0	0	0	378	1	0	0	0	428	0	1	0	0
329	1	0	0	0	379	1	0	0	0	429	0	1	0	0
330	1	0	0	0	380	1	0	0	0	430	0	1	0	0
331	1	0	0	0	381	1	0	0	0	431	0	1	0	0
332	1	0	0	0	382	1	0	0	0	432	0	1	0	0
333	1	0	0	0	383	1	0	0	0	433	0	1	0	0
334	1	0	0	0	384	1	0	0	0	434	0	1	0	0
335	1	0	0	0	385	1	0	0	0	435	0	1	0	0
336	1	0	0	0	386	1	0	0	0	436	0	1	0	0
337	1	0	0	0	387	1	0	0	0	437	0	1	0	0
338	1	0	0	0	388	1	0	0	0	438	0	1	0	0
339	1	0	0	0	389	1	0	0	0	439	0	1	0	0
340	1	0	0	0	390	1	0	0	0	440	0	1	0	0
341	1	0	0	0	391	1	0	0	0	441	0	1	0	0
342	1	0	0	0	392	1	0	0	0	442	0	1	0	0
343	1	0	0	0	393	1	0	0	0	443	0	1	0	0
344	1	0	0	0	394	1	0	0	0	444	0	1	0	0
345	1	0	0	0	395	1	0	0	0	445	0	1	0	0
346	1	0	0	0	396	1	0	0	0	446	0	1	0	0
347	1	0	0	0	397	1	0	0	0	447	0	1	0	0
348	1	0	0	0	398	1	0	0	0	448	0	1	0	0
349	1	0	0	0	399	1	0	0	0	449	0	1	0	0
350	1	0	0	0	400	1	0	0	0	450	0	1	0	0

No of passengers	Business	Tourist	Visit	Others	No of passengers	Business	Tourist	Visit	Others	No of passengers	Business	Tourist	Visit	Others
451	0	1	0	0	501	0	0	0	1	551	0	0	0	1
452	0	1	0	0	502	0	0	0	1	552	0	0	0	1
453	0	1	0	0	503	0	0	0	1	553	0	0	0	1
454	0	1	0	0	504	0	0	0	1	554	0	0	0	1
455	0	1	0	0	505	0	0	0	1	555	0	0	0	1
456	0	1	0	0	506	0	0	0	1	556	0	0	0	1
457	0	1	0	0	507	0	0	0	1	557	0	0	0	1
458	0	1	0	0	508	0	0	0	1	558	0	0	0	1
459	0	1	0	0	509	0	0	0	1	559	0	0	0	1
460	0	1	0	0	510	0	0	0	1	560	0	0	0	1
461	0	1	0	0	511	0	0	0	1	561	0	0	0	1
462	0	1	0	0	512	0	0	0	1	562	0	0	0	1
463	0	1	0	0	513	0	0	0	1	563	0	0	0	1
464	0	1	0	0	514	0	0	0	1	564	0	0	0	1
465	0	1	0	0	515	0	0	0	1	565	0	0	0	1
466	0	1	0	0	516	0	0	0	1	566	0	0	0	1
467	0	1	0	0	517	0	0	0	1	567	0	0	0	1
468	0	1	0	0	518	0	0	0	1	568	0	0	0	1
469	0	1	0	0	519	0	0	0	1	569	0	0	0	1
470	0	1	0	0	520	0	0	0	1	570	0	0	0	1
471	0	1	0	0	521	0	0	0	1	571	0	0	0	1
472	0	1	0	0	522	0	0	0	1	572	0	0	0	1
473	0	1	0	0	523	0	0	0	1	573	0	0	0	1
474	0	1	0	0	524	0	0	0	1	574	0	0	0	1
475	0	1	0	0	525	0	0	0	1	575	0	0	0	1
476	0	1	0	0	526	0	0	0	1	576	0	0	0	1
477	0	1	0	0	527	0	0	0	1	577	0	0	0	1
478	0	1	0	0	528	0	0	0	1	578	0	0	0	1
479	0	1	0	0	529	0	0	0	1	579	0	0	0	1
480	0	1	0	0	530	0	0	0	1	580	0	0	0	1
481	0	1	0	0	531	0	0	0	1	581	0	0	0	1
482	0	1	0	0	532	0	0	0	1	582	0	0	0	1
483	0	1	0	0	533	0	0	0	1	583	0	0	0	1
484	0	1	0	0	534	0	0	0	1	584	0	0	0	1
485	0	1	0	0	535	0	0	0	1	585	0	0	0	1
486	0	1	0	0	536	0	0	0	1	586	0	0	0	1
487	0	1	0	0	537	0	0	0	1	587	0	0	0	1
488	0	1	0	0	538	0	0	0	1	588	0	0	0	1
489	0	1	0	0	539	0	0	0	1	589	0	0	0	1
490	0	1	0	0	540	0	0	0	1	590	0	0	0	1
491	0	1	0	0	541	0	0	0	1	591	0	0	0	1
492	0	1	0	0	542	0	0	0	1	592	0	0	0	1
493	0	1	0	0	543	0	0	0	1	593	0	0	0	1
494	0	1	0	0	544	0	0	0	1	594	0	0	0	1
495	0	1	0	0	545	0	0	0	1	595	0	0	0	1
496	0	1	0	0	546	0	0	0	1	596	0	0	0	1
497	0	1	0	0	547	0	0	0	1	597	0	0	0	1
498	0	1	0	0	548	0	0	0	1	598	0	0	0	1
499	0	1	0	0	549	0	0	0	1	599	0	0	0	1
500	0	1	0	0	550	0	0	0	1	600	0	0	0	1

No of passengers	Business	Tourist	Visit	Others	No of passengers	Business	Tourist	Visit	Others	No of passengers	Business	Tourist	Visit	Others
601	0	0	0	1	651	0	0	0	0	701	0	0	0	1
602	0	0	0	1	652	0	0	0	0	702	0	0	0	1
603	0	0	0	1	653	0	0	0	0	703	0	0	0	1
604	0	0	0	1	654	0	0	0	0	704	0	0	0	1
605	0	0	0	1	655	0	0	0	0	705	0	0	0	1
606	0	0	0	1	656	0	0	0	0	706	0	0	0	1
607	0	0	0	1	657	0	0	0	0	707	0	0	0	1
608	0	0	0	1	658	0	0	0	0	708	0	0	0	1
609	0	0	0	1	659	0	0	0	0	709	0	0	0	1
610	0	0	0	1	660	0	0	0	0	710	0	0	0	1
611	0	0	0	1	661	0	0	0	0	711	0	0	0	1
612	0	0	0	1	662	0	0	0	0	712	0	0	0	1
613	0	0	0	1	663	0	0	0	0	713	0	0	0	1
614	0	0	0	1	664	0	0	0	0	714	0	0	0	1
615	0	0	0	1	665	0	0	0	0	715	0	0	0	1
616	0	0	0	1	666	0	0	0	0	716	0	0	0	1
617	0	0	0	1	667	0	0	0	0	717	0	0	0	1
618	0	0	0	1	668	0	0	0	0	718	0	0	0	1
619	0	0	0	1	669	0	0	0	0	719	0	0	0	1
620	0	0	0	1	670	0	0	0	0	720	0	0	0	1
621	0	0	0	1	671	0	0	0	0	721	0	0	0	1
622	0	0	0	1	672	0	0	0	0	722	0	0	0	1
623	0	0	0	1	673	0	0	0	0	723	0	0	0	1
624	0	0	0	1	674	0	0	0	0	724	0	0	0	1
625	0	0	0	1	675	0	0	0	0	725	0	0	0	1
626	0	0	0	1	676	0	0	0	0	726	0	0	0	1
627	0	0	0	1	677	0	0	0	0	727	0	0	0	1
628	0	0	0	1	678	0	0	0	0	728	0	0	0	1
629	0	0	0	1	679	0	0	0	0	729	0	0	0	1
630	0	0	0	1	680	0	0	0	0	730	0	0	0	1
631	0	0	0	1	681	0	0	0	0	731	0	0	0	1
632	0	0	0	1	682	0	0	0	0	732	0	0	0	1
633	0	0	0	1	683	0	0	0	0	733	0	0	0	1
634	0	0	0	1	684	0	0	0	0	734	0	0	0	1
635	0	0	0	1	685	0	0	0	0	735	0	0	0	1
636	0	0	0	1	686	0	0	0	0	736	0	0	0	1
637	0	0	0	1	687	0	0	0	0	737	0	0	0	1
638	0	0	0	1	688	0	0	0	0	738	0	0	0	1
639	0	0	0	1	689	0	0	0	0	739	0	0	0	1
640	0	0	0	1	690	0	0	0	0	740	0	0	0	1
641	0	0	0	1	691	0	0	0	0	741	0	0	0	1
642	0	0	0	1	692	0	0	0	0	742	0	0	0	1
643	0	0	0	1	693	0	0	0	0	743	0	0	0	1
644	0	0	0	1	694	0	0	0	0	744	0	0	0	1
645	0	0	0	1	695	0	0	0	0	745	0	0	0	1
646	0	0	0	1	696	0	0	0	0	746	0	0	0	1
647	0	0	0	1	697	0	0	0	0	747	0	0	0	1
648	0	0	0	1	698	0	0	0	0	748	0	0	0	1
649	0	0	0	1	699	0	0	0	0	749	0	0	0	1
650	0	0	0	1	700	0	0	0	0	750	0	0	0	1

No of passengers	Business	Tourist	Visit	Others
751	0	0	0	1
752	0	0	0	1
753	0	0	0	1
754	0	0	0	1
755	0	0	0	1
756	0	0	0	1
757	0	0	0	1
758	0	0	0	1
759	0	0	0	1
760	0	0	0	1
761	0	0	0	1
762	0	0	0	1
763	0	0	0	1
764	0	0	0	1
765	0	0	0	1
766	0	0	0	1
767	0	0	0	1
768	0	0	0	1
769	0	0	0	1
770	0	0	0	1
771	0	0	0	1
772	0	0	0	1
773	0	0	0	1
774	0	0	0	1
775	0	0	0	1
776	0	0	0	1
777	0	0	0	1
778	0	0	0	1
779	0	0	0	1
780	0	0	0	1
781	0	0	0	1
782	0	0	0	1
783	0	0	0	1
784	0	0	0	1
785	0	0	0	1
786	0	0	0	1
787	0	0	0	1
788	0	0	0	1
789	0	0	0	1
790	0	0	0	1
791	0	0	0	1
792	0	0	0	1
793	0	0	0	1
794	0	0	0	1
795	0	0	0	1
796	0	0	0	1
797	0	0	0	1
798	0	0	0	1
799	0	0	0	1
800	0	0	0	1
TOTAL	408	105	185	102
	0.51	0.13125	0.23125	0.1275

APPENDIX 2

ARRIVALS PEAK HOUR PASSENGER FORECAST

FROM 1999-2010

ARRIVAL PASSENGERS

YEAR	% GROWTH	DISSEMBARK	ARRIVING PAX.	TRANSFER PASSENGERS	TRANSIT PASSENGERS
1992	-	1,245	747	498	390
1993	7.78%	1,350	810	540	406
1994	6.20%	1,439	863	576	520
1995	3.00%	1,483	890	593	551
1996	-1.40%	1,463	878	585	573
1997	3.00%	1,506	904	602	533
1998	3.30%	1,560	936	624	458
1999	3.20%	1,610	966	644	464
2000	3.20%	1,661	997	665	471
2001	3.20%	1,715	1,029	686	478
2002	3.20%	1,769	1,062	708	484
2003	3.20%	1,826	1,096	730	491
2004	3.20%	1,885	1,131	754	498
2005	3.20%	1,945	1,167	778	505
2006	3.20%	2,007	1,204	803	512
2007	3.20%	2,071	1,243	829	519
2008	3.20%	2,138	1,283	855	526
2009	3.20%	2,206	1,324	882	534
2010	3.20%	2,277	1,366	911	541
AVERAGE=	3.35%			AVG GROWTH = 1.5%	
EXISTING CAPACITY		1170	702	468	NON

DEPARTURES PEAK HOUR PASSENGER FORECAST

FROM 1999-2010

DEPARTURE PASSENGERS

YEAR	% GROWTH	EMBARKED	DEPARTING PASSENGERS	TRANSFERS PASSENGERS	TRANSIT PASSENGERS
1992	0	914	548	366	260
1993	10.00%	1,016	610	406	270
1994	7.20%	1,095	657	438	346
1995	4.20%	1,143	686	457	367
1996	-2.00%	1,121	673	448	422
1997	3.00%	1,156	694	462	392
1998	1.20%	1,170	702	468	337
1999	3.20%	1,207	724	483	342
2000	3.20%	1,246	748	498	347
2001	3.20%	1,286	772	514	352
2002	3.20%	1,327	796	531	358
2003	3.20%	1,370	822	548	363
2004	3.20%	1,413	848	565	368
2005	3.20%	1,459	875	583	374
2006	3.20%	1,505	903	602	380
2007	3.20%	1,553	932	621	385
2008	3.20%	1,603	962	641	391
2009	3.20%	1,654	993	662	397
2010	3.20%	1,707	1,024	683	403
AVERAGE=	3.44%	780	468	312	NON
EXISTING CAPACITY					AVG GROWTH = 1.5%

Regression Output:

Constant	-53940.8
Std Err of Y Est	63.7109
R Squared	0.512548
No. of Observations	7
Degrees of Freedom	5
X Coefficient(s)	27.60714
Std Err of Coef.	12.04023

3 APPENDIX

Landing charges sensitivity analysis

MTOW In Kg	Rate In BD	Revenue In BD	Rate In BD	Revenue In BD	Rate In BD	Revenue In BD	Rate In BD	Revenue In BD	Rate In BD	Revenue In BD
Up 7,000	6.8	9,810	7	10,010	7	10,010	7.7	11,011	8.05	11,512
7,001 - 50,000	1.3	37,915	1.4	38,689	1.5	41,452	1.54	42,558	1.61	44,492
50,001 - 100,000	1.5	1,443,366	1.6	1,472,822	1.7	1,564,874	1.76	1,620,104	1.84	1,693,745
100,001 - 150,000	1.6	183,433	1.7	187,176	1.8	198,187	1.87	205,894	1.955	215,252
Over 150,000	1.7	2,482,574	1.8	2,533,239	1.9	2,673,974	1.98	2,786,563	2.07	2,913,225
Total		4,157,088		4,241,937		4,488,498		4,666,130		4,878,226
Business loss of 10%		3,741,388		3,817,743		4,039,648		4,199,517		4,390,403
Business loss of 15%		3,533,533		3,605,646		3,815,223		3,966,211		4,146,492
Business loss of 20%		3,325,878		3,393,550		3,590,798		3,732,904		3,902,581

Revenue from landing under existing system.

Type of aircraft	MTOW in Kgs.	No. of landing	Total weights	Revenue	Total
<u>Upto 7,000 Kg</u>					
SW4	7,000	677	4,739,000	4,739.000	
Private	7,000	753	5,271,000	5,271.000	10,010.000
<u>7,001 to 136,000 Kg</u>					
A320	76,000	135	10,260,000	14,364.000	
D757	114,000	11	1,254,000	1,755.600	
TU5	100,000	143	14,300,000	20,020.000	
B320	83,000	104	8,632,000	12,084.800	
A310	135,000	15	2,025,000	2,835.000	
B737	84,000	10	840,000	1,176.000	
A320	83,000	96	7,968,000	11,155.200	
A320	83,000	6644	551,452,000	772,032.800	
A320	74,000	297	21,978,000	30,769.200	
B757	114,000	25	2,850,000	3,990.000	
A320	83,000	297	24,651,000	34,511.400	
B727	84,000	29	2,436,000	3,410.400	
B737	84,000	1	84,000	117.600	
A320	83,000	282	23,406,000	32,768.400	
A310	135,000	40	5,400,000	7,560.000	
AB320	83,000	300	24,900,000	34,860.000	
A310	135,000	46	6,210,000	8,694.000	
B727	84,000	2	168,000	235.200	
C130	73,000	831	60,663,000	84,928.200	
A320	74,000	13	962,000	1,346.800	
B757	100,000	157	15,700,000	21,980.000	
B737	84,000	84	7,056,000	9,878.400	
CBO	75,000	123	9,225,000	12,915.000	
HS25	12,000	46.5	558,000	781.200	
H125	10,000	46.5	465,000	651.000	
NIM	94,000	21.5	2,021,000	2,829.400	
B737	84,000	127	10,668,000	14,935.200	
B727	84,000	101	8,484,000	11,877.600	
B737	69,000	104	7,176,000	10,046.400	
B737	84,000	10	840,000	1,176.000	
B727	84,000	41	3,444,000	4,821.600	
F27	33,000	316	10,428,000	14,599.200	
SW32	8,000	2023	16,184,000	22,657.600	
BC190	80,000	1290	103,200,000	144,480.000	1,352,243.200

Revenue from landing under existing system. - *Contin....*

<u>Over 136,000 Kg</u>					
L1011	212,000	103	21,836,000	32,754.000	
A300B4	140,000	212	29,680,000	44,520.000	
B767	185,000	130	24,050,000	36,075.000	
DC10	264,000	143	37,752,000	56,628.000	
B777	230,000	840	193,200,000	289,800.000	
B747	392,000	1	392,000	588.000	
L1011	212,000	192	40,704,000	61,056.000	
AB6	200,000	40	8,000,000	12,000.000	
B747	392,000	3	1,176,000	1,764.000	
A340	267,000	5	1,335,000	2,002.500	
B767	185,000	2593.5	479,797,500	719,696.250	
A340	267,000	1455.5	388,618,500	582,927.750	
L1011	205,000	3	615,000	922.500	
AB3	200,000	48	9,600,000	14,400.000	
B707	151,000	1	151,000	226.500	
B707	151,000	11	1,661,000	2,491.500	
L1011	205,000	3	615,000	922.500	
B747	392,000	7	2,744,000	4,116.000	
A300	140,000	10	1,400,000	2,100.000	
AB6	200,000	18	3,600,000	5,400.000	
A340	267,000	3	801,000	1,201.500	
B767	156,000	355	55,380,000	83,070.000	
B747	392,000	53	20,776,000	31,164.000	
AB600	200,000	284	56,800,000	85,200.000	
AB3	200,000	157	31,400,000	47,100.000	
L1011	205,000	43	8,815,000	13,222.500	
VC10	147,000	395	58,065,000	87,097.500	
A300	140,000	23	3,220,000	4,830.000	
B747	392,000	10	3,920,000	5,880.000	
TRI	205,000	62	12,710,000	19,065.000	
B707	151,000	6	906,000	1,359.000	1,647,746.800
Total				3,010,000.000	

Revenue from landing charges under option 3

Type of aircraft	MTOW in Kgs.	No. of landing	Total weights	Revenue	Total
upto 7,000 kg					
SW4	7,000	677	4,739,000	4,739.000	
Private	7,000	753	5,271,000	5,271.000	10,010.000
7,001 to 50,000 kg					
SW32	8,000	2023	16,184,000	22,657.600	
H125	10,000	46.5	465,000	651.000	
HS25	12,000	46.5	558,000	781.200	
F27	33,000	316	10,428,000	14,599.200	38,689.000
50,001-100,000					
B737	69,000	104	7,176,000	11,481.600	
C130	73,000	831	60,663,000	97,060.800	
A320	74,000	297	21,978,000	35,164.800	
A320	74,000	13	962,000	1,539.200	
CBO	75,000	123	9,225,000	14,760.000	
A320	76,000	135	10,260,000	16,416.000	
BC190	80,000	1290	103,200,000	165,120.000	
B320	83,000	104	8,632,000	13,811.200	
A320	83,000	96	7,968,000	12,748.800	
A320	83,000	6644	551,452,000	882,323.200	
A320	83,000	297	24,651,000	39,441.600	
A320	83,000	282	23,406,000	37,449.600	
AB320	83,000	300	24,900,000	39,840.000	
B737	84,000	10	840,000	1,344.000	
B727	84,000	29	2,436,000	3,897.600	
B737	84,000	1	84,000	134.400	
B727	84,000	2	168,000	268.800	
B737	84,000	84	7,056,000	11,289.600	
B737	84,000	127	10,668,000	17,068.800	
B727	84,000	101	8,484,000	13,574.400	
B737	84,000	10	840,000	1,344.000	
B727	84,000	41	3,444,000	5,510.400	
NIM	94,000	21.5	2,021,000	3,233.600	
TU5	100,000	143	14,300,000	22,880.000	
B757	100,000	157	15,700,000	25,120.000	1,472,822.400
100,000-150,000 kg					
D757	114,000	11	1,254,000	2,131.800	
B757	114,000	25	2,850,000	4,845.000	
A310	135,000	15	2,025,000	3,442.500	
A310	135,000	40	5,400,000	9,180.000	
A310	135,000	46	6,210,000	10,557.000	
A300B4	140,000	212	29,680,000	50,456.000	
A300	140,000	10	1,400,000	2,380.000	
A300	140,000	23	3,220,000	5,474.000	
VC10	147,000	395	58,065,000	98,710.500	187,176.800

Revenue from landing charges under option 3 - *Contin...*

Over 150,000kg

B707	151,000	1	151,000	271.800	
B707	151,000	11	1,661,000	2,989.800	
B707	151,000	6	906,000	1,630.800	
B767	156,000	355	55,380,000	99,684.000	
B767	185,000	130	24,050,000	43,290.000	
B767	185,000	2593.5	479,797,500	863,635.500	
AB6	200,000	40	8,000,000	14,400.000	
AB3	200,000	48	9,600,000	17,280.000	
AB6	200,000	18	3,600,000	6,480.000	
AB600	200,000	284	56,800,000	102,240.000	
AB3	200,000	157	31,400,000	56,520.000	
L1011	205,000	3	615,000	1,107.000	
L1011	205,000	3	615,000	1,107.000	
L1011	205,000	43	8,815,000	15,867.000	
TRI	205,000	62	12,710,000	22,878.000	
L1011	212,000	103	21,836,000	39,304.800	
L1011	212,000	192	40,704,000	73,267.200	
B777	230,000	840	193,200,000	347,760.000	
DC10	264,000	143	37,752,000	67,953.600	
A340	267,000	5	1,335,000	2,403.000	
A340	267,000	1455.5	388,618,500	699,513.300	
A340	267,000	3	801,000	1,441.800	
B747	392,000	1	392,000	705.600	
B747	392,000	3	1,176,000	2,116.800	
B747	392,000	7	2,744,000	4,939.200	
B747	392,000	53	20,776,000	37,396.800	
B747	392,000	10	3,920,000	7,056.000	2,533,239.000
Total revenue from landing charges (without surcharge)					4,241,937.200
Expected revenue from surcharge (Assuming that 30% of the aircrafts landing during peak time)					127,258.116
Total revenue from landing charges (with surcharge)					4,369,195.316
Percentage of increase in landing revenue (without surcharge)					40.9%
Percentage of increase in landing revenue (with surcharge)					49.1%

Revenue from landing charges under Option 4

Type of aircraft	MTOW in Kgs.	No. of landing	Total weights	Revenue	Total
upto 7,000 kg					
SW4	7,000	677	4,739,000	4,739.000	
Private	7,000	753	5,271,000	5,271.000	10,010.000
7,001 to 50,000 kg					
SW32	8,000	2023	16,184,000	24,276.000	
H125	10,000	46.5	465,000	697.500	
HS25	12,000	46.5	558,000	837.000	
F27	33,000	316	10,428,000	15,642.000	41,452.500
50,001 to 100,000 kg					
B737	69,000	104	7,176,000	12,199.200	
C130	73,000	831	60,663,000	103,127.100	
A320	74,000	297	21,978,000	37,362.600	
A320	74,000	13	962,000	1,635.400	
CBO	75,000	123	9,225,000	15,682.500	
A320	76,000	135	10,260,000	17,442.000	
BC190	80,000	1290	103,200,000	175,440.000	
B320	83,000	104	8,632,000	14,674.400	
A320	83,000	96	7,968,000	13,545.600	
A320	83,000	6644	551,452,000	937,468.400	
A320	83,000	297	24,651,000	41,906.700	
A320	83,000	282	23,406,000	39,790.200	
AB320	83,000	300	24,900,000	42,330.000	
B737	84,000	10	840,000	1,428.000	
B727	84,000	29	2,436,000	4,141.200	
B737	84,000	1	84,000	142.800	
B727	84,000	2	168,000	285.600	
B737	84,000	84	7,056,000	11,995.200	
B737	84,000	127	10,668,000	18,135.600	
B727	84,000	101	8,484,000	14,422.800	
B737	84,000	10	840,000	1,428.000	
B727	84,000	41	3,444,000	5,854.800	
NIM	94,000	21.5	2,021,000	3,435.700	
TU5	100,000	143	14,300,000	24,310.000	
B757	100,000	157	15,700,000	26,690.000	1,564,873.800
100,001 to 150,000 kg					
D757	114,000	11	1,254,000	2,257.200	
B757	114,000	25	2,850,000	5,130.000	
A310	135,000	15	2,025,000	3,645.000	
A310	135,000	40	5,400,000	9,720.000	
A310	135,000	46	6,210,000	11,178.000	
A300B4	140,000	212	29,680,000	53,424.000	
A300	140,000	10	1,400,000	2,520.000	
A300	140,000	23	3,220,000	5,796.000	
VC10	147,000	395	58,065,000	104,517.000	198,187.200

Revenue from landing charges under Option 4 ---- *Contin...*

OVER 150,000 kg				
B707	151,000	1	151,000	286.900
B707	151,000	11	1,661,000	3,155.900
B707	151,000	6	906,000	1,721.400
B767	156,000	355	55,380,000	105,222.000
B767	185,000	130	24,050,000	45,695.000
B767	185,000	2593.5	479,797,500	911,615.250
AB6	200,000	40	8,000,000	15,200.000
AB3	200,000	48	9,600,000	18,240.000
AB6	200,000	18	3,600,000	6,840.000
AB600	200,000	284	56,800,000	107,920.000
AB3	200,000	157	31,400,000	59,660.000
L1011	205,000	3	615,000	1,168.500
L1011	205,000	3	615,000	1,168.500
L1011	205,000	43	8,815,000	16,748.500
TRI	205,000	62	12,710,000	24,149.000
L1011	212,000	103	21,836,000	41,488.400
L1011	212,000	192	40,704,000	77,337.600
B777	230,000	840	193,200,000	367,080.000
DC10	264,000	143	37,752,000	71,728.800
A340	267,000	5	1,335,000	2,536.500
A340	267,000	1455.5	388,618,500	738,375.150
A340	267,000	3	801,000	1,521.900
B747	392,000	1	392,000	744.800
B747	392,000	3	1,176,000	2,234.400
B747	392,000	7	2,744,000	5,213.600
B747	392,000	53	20,776,000	39,474.400
B747	392,000	10	3,920,000	7,448.000
				2,673,974.500
Total revenue from landing charges (without surcharge)				4,488,498.000
Expected revenue from surcharge (Assuming that 30% of the aircrafts landing during peak time)				134,654.940
Total revenue from landing charges (with surcharge)				4,623,152.940
Percentage of increase in landing revenue (without surcharge)				44.9%
Percentage of increase in landing revenue (with surcharge)				54.1%

Table : Weights of the Aircraft's and the Area Occupied it

MTOW (KGS)	NO. OF LANDINGS IN THIS WEIGHT IN 1998	LENGTH x WING SPAN SQ. METERS OF AIRCRAFT
33000	316	683.24
69000	104	1537.0348
74000 to 83000	8168	1273.9987
84,000	10	1153.8453
84,000	395	1537.0348
100,000	143	1894.445
100,000	157	1800.526
114,000	11	1798.645
114,000	25	1800.526
135,200	101	2047.9074
140000	245	2424.9472
151,000	18	2070.4162
15600 to 185000	3078.5	2613.24
200,000	284	2424.9472
200,000	157	2878.8895
202000 to 212000	406	2369.367
230,000	840	3883.0689
264,000	143	2797.2
267,000	1463.5	2583.5376
392,000	74	4587.2472

Option Two								
STANDARD CHARGES BASED ON THREE CATEGORIES								
<i>Airline</i>	<i>Type of aircraft</i>	<i>MTOW in Tons</i>	<i>No. of Mov.</i>	<i>% of standard Mov.</i>	<i>Charge</i>	<i>New charge a% of Ovr. Frmla</i>	<i>New charge Ovr. Frmla/ month</i>	<i>INCREASE</i>
Air Lanka	L1011	212	206	0.37%	7,786.80	9,270.00	-	1,483.20
Air Lanka	A320	76	2	0.00%	37.80	90.00	-	52.20
Air India	A300B4	140	424	0.75%	13,356.00	19,080.00	-	5,724.00
Air India	B747	392	126	0.22%	5,292.00	7,560.00	-	2,268.00
Airtour	B757	114	72	0.13%	1,094.40	3,240.00	-	2,145.60
Airtour	B767	185	188	0.33%	8,190.00	8,460.00	-	270.00
Air Malta	A320	76	270	0.48%	5,103.00	12,150.00	-	7,047.00
American Trans	B757	114	24	0.04%	554.40	1,080.00	-	525.60
Balkan	TU5	100	208	0.37%	7,207.20	9,360.00	-	2,152.80
Balkan	B737	84	76	0.14%	1,915.20	3,420.00	-	1,504.80
Balkan	B767	185	2	0.00%	63.00	90.00	-	27.00
Biman Banglades	DC10	264	106	0.19%	4,006.80	4,770.00	-	763.20
British Airways	B777	230	1676	2.98%	63,504.00	75,420.00	-	11,916.00
British Airways	B747	392	4	0.01%	168.00	240.00	-	72.00
Cathy Pacific	B747	392	2	0.00%	84.00	120.00	-	36.00
Caledonian	A320	76	4	0.01%	75.60	180.00	-	104.40
Caledonian	DC10	264	2	0.00%	75.60	90.00	-	14.40
Caledonian	L1011	212	384	0.68%	14,515.20	17,280.00	-	2,764.80
Cyprus Airways	AB320	83	208	0.37%	5,241.60	9,360.00	-	4,118.40
Czechoslovak	A310	135	30	0.05%	945.00	1,350.00	-	405.00
Egypt Air	AB6	200	80	0.14%	3,024.00	3,600.00	-	576.00
Egypt Air	B747	392	6	0.01%	252.00	360.00	-	108.00
Egypt Air	B737	84	20	0.04%	504.00	900.00	-	396.00
Egypt Air	A340	267	10	0.02%	378.00	450.00	-	72.00
Egypt Air	A320	83	192	0.34%	4,838.40	8,640.00	-	3,801.60
Gulf Air	A320	83	13288	23.66%	334,857.60	597,960.00	-	263,102.40
Gulf Air	B767	185	5187	9.23%	163,390.50	233,415.00	-	70,024.50
Gulf Air	A340	267	2911	5.18%	110,035.80	130,995.00	-	20,959.20
Gulf Air	L1011	205	6	0.01%	226.80	270.00	-	43.20
Indian Airline	A320	74	594	1.06%	11,226.60	26,730.00	-	15,503.40
Finair	B757	114	50	0.09%	1,260.00	2,250.00	-	990.00
Iran Air	AB3	200	96	0.17%	3,024.00	4,320.00	-	1,296.00
Iran Air	B707	151	2	0.00%	63.00	90.00	-	27.00
Iran Air	B727	84	58	0.10%	1,461.60	2,610.00	-	1,148.40
Iran Air	B737	84	2	0.00%	50.40	90.00	-	39.60
Royal Jordanian	A320	83	564	1.00%	14,212.80	25,380.00	-	11,167.20
Royal Jordanian	B707	151	22	0.04%	693.00	990.00	-	297.00
Royal Jordanian	L1011	205	6	0.01%	226.80	270.00	-	43.20
Royal Jordanian	A310	135	80	0.14%	2,520.00	3,600.00	-	1,080.00
Korean Air	A340	267	0	0.00%	-	-	-	0.00
Kuwait Airways	AB320	83	600	1.07%	15,120.00	27,000.00	-	11,880.00
Kuwait Airways	A310	135	92	0.16%	2,898.00	4,140.00	-	1,242.00
Kuwait Airways	B727	84	4	0.01%	100.80	180.00	-	79.20
Kuwait Airways	B747	392	14	0.02%	588.00	840.00	-	252.00
Kuwait Airways	A300	140	20	0.04%	630.00	900.00	-	270.00
Kuwait Airways	AB6	200	36	0.06%	1,360.80	1,620.00	-	259.20
Kuwait Airways	A340	267	6	0.01%	226.80	270.00	-	43.20
Kuwait Airways	B707	151	6	0.01%	189.00	270.00	-	81.00
K.L.M	B767	156	710	1.26%	22,365.00	31,950.00	-	9,585.00

Lufthansa	B747	392	106	0.19%	4,452.00	6,360.00	-	1,908.00
MAC	C130	73	908	1.62%	31,411.80	40,860.00	-	9,448.20
MAC	C5	8	54	0.10%	680.40	1,350.00	-	669.60
MAC	C137	155	45	0.08%	1,417.50	2,025.00	-	607.50
MAC	C141	144	143	0.25%	4,504.50	6,435.00	-	1,930.50
MAC	B757	100	118	0.21%	2,973.60	5,310.00	-	2,336.40
MAC	MD11	284	6	0.01%	226.80	270.00	-	43.20
MAC	DC10	264	18	0.03%	680.40	810.00	-	129.60
MAC	C135	138	15	0.03%	472.50	675.00	-	202.50
MAC	DC9	55	29	0.05%	548.10	725.00	-	176.90
MAC	TRJ	212	16	0.03%	604.80	720.00	-	115.20
MAC	KC10	258	65	0.12%	2,457.00	2,925.00	-	468.00
MAC	DC8	161	114	0.20%	3,591.00	5,130.00	-	1,539.00
M.E.A	A320	74	26	0.05%	491.40	1,170.00	-	678.60
Monarch	AB600	200	568	1.01%	17,892.00	25,560.00	-	7,668.00
Monarch	B757	100	314	0.56%	7,912.80	14,130.00	-	6,217.20
P.I.A	AB3	200	156	0.28%	4,914.00	7,020.00	-	2,106.00
P.I.A	B737	84	168	0.30%	4,233.60	7,560.00	-	3,326.40
Tarom	B737	69	40	0.07%	756.00	1,800.00	-	1,044.00
Royal Brunei	B767	180	0	0.00%	-	-	-	0.00
R.A.F	CBO	75	246	0.44%	4,649.40	11,070.00	-	6,420.60
R.A.F	HS25	12	93	0.17%	1,171.80	2,325.00	-	1,153.20
R.A.F	L1011	205	86	0.15%	3,250.80	3,870.00	-	619.20
R.A.F	H125	10	93	0.17%	1,171.80	2,325.00	-	1,153.20
R.A.F	VC10	147	790	1.41%	24,885.00	35,550.00	-	10,665.00
R.A.F	NIM	94	43	0.08%	812.70	1,935.00	-	1,122.30
Saudia	B737	84	254	0.45%	6,400.80	11,430.00	-	5,029.20
Saudia	A300	140	46	0.08%	1,449.00	2,070.00	-	621.00
Saudia	B747	392	20	0.04%	840.00	1,200.00	-	360.00
Saudia	TRJ	205	124	0.22%	4,687.20	5,580.00	-	892.80
Syrian Air	B747	392	10	0.02%	420.00	600.00	-	180.00
Syrian Air	B727	84	190	0.34%	5,090.40	8,550.00	-	3,459.60
Syrian Air	TU154	100	2	0.00%	50.40	90.00	-	39.60
Turkish Airlines	B737	69	198	0.35%	3,931.20	8,910.00	-	4,978.80
Turkish Airlines	A310	135	10	0.02%	315.00	450.00	-	135.00
Yemen Airways	B737	84	20	0.04%	504.00	900.00	-	396.00
Yemen Airways	B727	84	82	0.15%	2,066.40	3,690.00	-	1,623.60
Cargo Flights	SW4	7	1354	2.41%	17,060.40	33,850.00	-	16,789.60
Cargo Flights	F27	33	632	1.13%	7,963.20	15,800.00	-	7,836.80
Cargo Flights	SW32	8	4046	7.20%	50,979.60	101,150.00	-	50,170.40
Cargo Flights	B707	151	12	0.02%	302.40	540.00	-	237.60
Cargo Flights	BC190	80	2580	4.59%	48,762.00	116,100.00	-	67,338.00
Cargo Flights	B727	84	2	0.00%	50.40	90.00	-	39.60
Private	SW32	7	459	0.82%	5,783.40	11,475.00	-	5,691.60
Private	SW4	7	1047	1.86%	13,192.20	26,175.00	-	12,982.80
Others	AN12	390	38	0.07%	1,596.00	2,280.00	-	684.00
Others	B707	151	53	0.09%	1,669.50	2,385.00	-	715.50
Others	B747	392	6	0.01%	252.00	360.00	-	108.00
Others	B757	100	64	0.11%	1,612.80	2,880.00	-	1,267.20
Others	BN2J	90	2	0.00%	50.40	90.00	-	39.60
Others	DC10F	264	6	0.01%	226.80	270.00	-	43.20
Others	IL86	210	4	0.01%	151.20	180.00	-	28.80
Others	MD11	284	4	0.01%	151.20	180.00	-	28.80
Others	SW32	7	2	0.00%	25.20	50.00	-	24.80
Others	TRJ	205	2	0.00%	75.60	90.00	-	14.40
Total			44205	78.70%	-	-	-	0.00
Actual Total		56169	100.00%		1636759	1838025		201266

Option Two

Surcharge	Up to 60,000 kg	BD 25.000
	60,001-300,000	BD 45.000
	Above 300,000	BD 60.000

Aircra ft type	MTOW in Tones	Group	Charge per aircraft	No. of Mov. in one Month	Existing Charge in one month	No. of Mov. in one Year	Existing Charge per year	New charge per aircraft	New charge per year
A300	140	M	47.25	90	4252.5	1080	51030.000	67.5	72900.000
A306	160	M	47.25	512	24192	6144	290304.000	67.5	414720.000
A30B	160	M	47.25	37	1748.25	444	20979.000	67.5	29970.000
A310	135	M	47.25	587	27735.75	7044	332829.000	67.5	475470.000
A320	76	M	28.35	676	19164.6	8112	229975.200	67.5	547560.000
A321	64	M	28.35	2	56.7	24	680.400	67.5	1620.000
A330	212	M	56.7	102	5783.4	1224	69400.800	67.5	82620.000
A340	267	M	56.7	256	14515.2	3072	174182.400	67.5	207360.000
AC95	40	S	18.9	1	18.9	12	226.800	37.5	450.000
AEST	40	S	18.9	1	18.9	12	226.800	37.5	450.000
AN12	390	H	63	15	945	180	11340.000	90	16200.000
AN24	24	S	18.9	4	75.6	48	907.200	37.5	1800.000
AN26	40	S	18.9	4	75.6	48	907.200	37.5	1800.000
AN72	40	S	18.9	1	18.9	12	226.800	37.5	450.000
AT42	17	S	18.9	2	37.8	24	453.600	37.5	900.000
ATLA	60	M	28.35	1	28.35	12	340.200	67.5	810.000
B190	60	M	28.35	77	2182.95	924	26195.400	67.5	62370.000
B350	40	S	18.9	7	132.3	84	1587.600	37.5	3150.000
B701	160	M	47.25	3	141.75	36	1701.000	67.5	2430.000
B703	160	M	47.25	49	2315.25	588	27783.000	67.5	39690.000
B707	151	M	47.25	40	1890	480	22680.000	67.5	32400.000
B721	100	M	37.8	13	491.4	156	5896.800	67.5	10530.000
B722	100	M	37.8	50	1890	600	22680.000	67.5	40500.000
B727	84	M	37.8	96	3628.8	1152	43545.600	67.5	77760.000
B732	60	M	28.35	5	141.75	60	1701.000	67.5	4050.000
B733	60	M	28.35	39	1105.65	468	13267.800	67.5	31590.000
B734	60	M	28.35	67	1899.45	804	22793.400	67.5	54270.000
B735	60	M	28.35	16	453.6	192	5443.200	67.5	12960.000
B737	84	M	37.8	24	907.2	288	10886.400	67.5	19440.000
B73A	60	M	28.35	1	28.35	12	340.200	67.5	810.000
B73B	60	M	28.35	38	1077.3	456	12927.600	67.5	30780.000
B741	320	H	63	86	5418	1032	65016.000	90	92880.000
B742	320	H	63	206	12978	2472	155736.000	90	222480.000
B743	320	H	63	274	17262	3288	207144.000	90	295920.000
B744	320	H	63	304	19152	3648	229824.000	90	328320.000
B747	392	H	63	313	19719	3756	236628.000	90	338040.000
B74A	320	H	63	1	63	12	756.000	90	1080.000
B74B	320	H	63	3	189	36	2268.000	90	3240.000
B74F	320	H	63	21	1323	252	15876.000	90	22680.000
B74S	320	H	63	15	945	180	11340.000	90	16200.000
B752	100	M	37.8	13	491.4	156	5896.800	67.5	10530.000
B757	100	M	37.8	23	869.4	276	10432.800	67.5	18630.000
B762	160	M	47.25	11	519.75	132	6237.000	67.5	8910.000
B763	160	M	47.25	340	16065	4080	192780.000	67.5	275400.000
B767	156	M	47.25	112	5292	1344	63504.000	67.5	90720.000
B772	250	M	56.7	455	25798.5	5460	309582.000	67.5	368550.000
B773	250	M	56.7	14	793.8	168	9525.600	67.5	11340.000
B777	230	M	56.7	212	12020.4	2544	144244.800	67.5	171720.000
BA11	45	S	28.35	18	510.3	216	6123.600	37.5	8100.000
BE02	40	S	18.9	10	189	120	2268.000	37.5	4500.000
BE19	40	S	18.9	36	680.4	432	8164.800	37.5	16200.000
BE20	6	S	18.9	21	396.9	252	4762.800	37.5	9450.000

BE36	60	M	28.35	2	56.7	24	680.400	67.5	1620.000
C12	5	S	18.9	5	94.5	60	1134.000	37.5	2250.000
C130	73	M	28.35	140	3969	1680	47628.000	67.5	113400.000
C135	138	M	47.25	1	47.25	12	567.000	67.5	810.000
C141	144	M	47.25	11	519.75	132	6237.000	67.5	8910.000
C160	40	S	18.9	3	56.7	36	680.400	37.5	1350.000
C208	40	S	18.9	2	37.8	24	453.600	37.5	900.000
C21	8	S	18.9	4	75.6	48	907.200	37.5	1800.000
C5	380	H	63	15	945	180	11340.000	90	16200.000
C500	40	S	18.9	1	18.9	12	226.800	37.5	450.000
C560	8	S	18.9	5	94.5	60	1134.000	37.5	2250.000
C650	11	S	18.9	2	37.8	24	453.600	37.5	900.000
CARJ	40	S	18.9	2	37.8	24	453.600	37.5	900.000
CL60	50	S	28.35	17	481.95	204	5783.400	37.5	7650.000
CL64	40	S	18.9	1	18.9	12	226.800	37.5	450.000
CL65	24	S	18.9	1	18.9	12	226.800	37.5	450.000
CN35	16	S	18.9	1	18.9	12	226.800	37.5	450.000
DA50	20	S	18.9	1	18.9	12	226.800	37.5	450.000
DA90	40	S	18.9	1	18.9	12	226.800	37.5	450.000
DC10	264	M	56.7	228	12927.6	2736	155131.200	67.5	184680.000
DC8	161	M	47.25	40	1890	480	22680.000	67.5	32400.000
DC86	160	M	47.25	5	236.25	60	2835.000	67.5	4050.000
DC9	55	S	28.35	1	28.35	12	340.200	37.5	450.000
DDDD	320	H	63	1	63	12	756.000	90	1080.000
DH6	6	S	18.9	1	18.9	12	226.800	37.5	450.000
DH8	16	S	18.9	1	18.9	12	226.800	37.5	450.000
DHC6	6	S	18.9	1	18.9	12	226.800	37.5	450.000
EA30	165	M	47.25	86	4063.5	1032	48762.000	67.5	69660.000
EA31	158	M	47.25	75	3543.75	900	42525.000	67.5	60750.000
EA32	83	M	37.8	99	3742.2	1188	44906.400	67.5	80190.000
EA33	217	M	56.7	29	1644.3	348	19731.600	67.5	23490.000
EA34	257	M	56.7	102	5783.4	1224	69400.800	67.5	82620.000
EA60	160	M	47.25	1	47.25	12	567.000	67.5	810.000
F100	43	S	28.35	1	28.35	12	340.200	37.5	450.000
F2TH	40	S	18.9	1	18.9	12	226.800	37.5	450.000
F406	40	S	18.9	1	18.9	12	226.800	37.5	450.000
F50	160	M	47.25	2	94.5	24	1134.000	67.5	1620.000
F900	160	M	47.25	44	2079	528	24948.000	67.5	35640.000
FA20	40	S	18.9	2	37.8	24	453.600	37.5	900.000
FA50	20	S	18.9	15	283.5	180	3402.000	37.5	6750.000
FK27	20	S	18.9	1	18.9	12	226.800	37.5	450.000
FK50	20	S	18.9	1	18.9	12	226.800	37.5	450.000
G2	33	S	18.9	9	170.1	108	2041.200	37.5	4050.000
G3	32	S	18.9	7	132.3	84	1587.600	37.5	3150.000

G4	32	S	18.9	26	491.4	312	5896.800	37.5	11700.000
GLF2	40	S	18.9	11	207.9	132	2494.800	37.5	4950.000
GLF3	40	S	18.9	4	75.6	48	907.200	37.5	1800.000
GLF4	40	S	18.9	40	756	480	9072.000	37.5	18000.000
GLF5	40	S	18.9	3	56.7	36	680.400	37.5	1350.000
GULF	40	S	18.9	8	151.2	96	1814.400	37.5	3600.000
H25B	40	S	18.9	3	56.7	36	680.400	37.5	1350.000
HAWK	70	M	28.35	7	198.45	84	2381.400	67.5	5670.000
HS25	12	S	18.9	11	207.9	132	2494.800	37.5	4950.000
IL18	64	M	28.35	3	85.05	36	1020.600	67.5	2430.000
IL62	167	M	47.25	22	1039.5	264	12474.000	67.5	17820.000
IL76	170	M	47.25	89	4205.25	1068	50463.000	67.5	72090.000
KC10	258	M	56.7	18	1020.6	216	12247.200	67.5	14580.000
KE3	160	M	47.25	1	47.25	12	567.000	67.5	810.000
L101	212	M	56.7	113	6407.1	1356	76885.200	67.5	91530.000
L29	40	S	18.9	1	18.9	12	226.800	37.5	450.000
L29B	160	M	47.25	5	236.25	60	2835.000	67.5	4050.000
L329	40	S	18.9	1	18.9	12	226.800	37.5	450.000
L382	71	M	28.35	7	198.45	84	2381.400	67.5	5670.000
LJ35	40	S	18.9	2	37.8	24	453.600	37.5	900.000
LJ60	40	S	18.9	1	18.9	12	226.800	37.5	450.000
LR35	9	S	18.9	3	56.7	36	680.400	37.5	1350.000
LR60	11	S	18.9	1	18.9	12	226.800	37.5	450.000
MD11	284	M	56.7	214	12133.8	2568	145605.600	67.5	173340.000
MD20	320	H	63	1	63	12	756.000	90	1080.000
MD80	68	M	28.35	4	113.4	48	1360.800	67.5	3240.000
MD82	73	M	28.35	1	28.35	12	340.200	67.5	810.000
MD90	71	M	28.35	82	2324.7	984	27896.400	67.5	66420.000
MRC	40	S	18.9	2	37.8	24	453.600	37.5	900.000
N265	11	S	18.9	3	56.7	36	680.400	37.5	1350.000
P3	21	S	18.9	4	75.6	48	907.200	37.5	1800.000
PAYE	25	S	18.9	1	18.9	12	226.800	37.5	450.000
PC12	40	S	18.9	1	18.9	12	226.800	37.5	450.000
SBR1	320	H	63	2	126	24	1512.000	90	2160.000
SBR2	320	H	63	7	441	84	5292.000	90	7560.000
T134	49	S	28.35	1	28.35	12	340.200	37.5	450.000
T154	98	M	37.8	10	378	120	4536.000	67.5	8100.000
TOR	40	S	18.9	1	18.9	12	226.800	37.5	450.000
TU34	47	S	28.35	6	170.1	72	2041.200	37.5	2700.000
TU54	100	M	37.8	21	793.8	252	9525.600	67.5	17010.000
VC10	147	M	47.25	2	94.5	24	1134.000	67.5	1620.000
YK42	52	S	28.35	1	28.35	12	340.200	37.5	450.000
Total						126,752	4204229.000		5906970.000

Option Three

Percentage Increased for standard charges

100.00%

STANDARD CHARGES ONLY

<i>Airline</i>	<i>Type of aircraft</i>	<i>MTOW in Tons</i>	<i>No. of Mov.</i>	<i>% of standard Mov.</i>	<i>Charge</i>	<i>New charge a% of Ovr.Frmia</i>	<i>New charge Ovr.Frmia/month</i>	<i>INCREASE</i>
Air Lanka	L1011	212	206	0.37%	7786.8	16377	16377	8,590.20
Air Lanka	A320	76	2	0.00%	37.8	80	57	42.20
Air India	A300B4	140	424	0.75%	13356	22260	22260	8,904.00
Air India	B747	392	126	0.22%	5292	18522	18522	13,230.00
Airtour	B757	114	72	0.13%	1094.4	2880	3078	1,785.60
Airtour	B767	185	188	0.33%	8190	13043	13043	4,852.50
Air Malta	A320	76	270	0.48%	5103	10800	7695	5,697.00
American Trans Air	B757	114	24	0.04%	554.4	960	1026	405.60
Balkan	TU5	100	208	0.37%	7207.2	8320	7800	1,112.80
Balkan	B737	84	76	0.14%	1915.2	3040	2394	1,124.80
Balkan	B767	185	2	0.00%	63	139	139	75.75
Biman Bangladesh	DC10	264	106	0.19%	4006.8	10494	10494	6,487.20
British Airways	B777	230	1676	2.98%	63504	144555	144555	81,051.00
British Airways	B747	392	4	0.01%	168	588	588	420.00
Cathy Pacific	B747	392	2	0.00%	84	294	294	210.00
Cyprus Airways	AB320	83	208	0.37%	5241.6	8320	6474	3,078.40
Caledonian	A320	76	4	0.01%	75.6	160	114	84.40
Caledonian	DC10	264	2	0.00%	75.6	198	198	122.40
Caledonian	L1011	212	384	0.68%	14515.2	30528	30528	16,012.80
Czechoslovak	A310	135	30	0.05%	945	1519	1519	573.75
Egypt Air	AB6	200	80	0.14%	3024	6000	6000	2,976.00
Egypt Air	B747	392	6	0.01%	252	882	882	630.00
Egypt Air	B737	84	20	0.04%	504	800	630	296.00
Egypt Air	A340	267	10	0.02%	378	1001	1001	623.25
Egypt Air	A320	83	192	0.34%	4838.4	7680	5976	2,841.60
Gulf Air	A320	83	13288	23.66%	334857.6	531520	413589	196,662.40
Gulf Air	B767	185	5187	9.23%	163390.5	359848	359848	196,457.63
Gulf Air	A340	267	2911	5.18%	110035.8	291464	291464	181,428.08
Gulf Air	L1011	205	6	0.01%	226.8	461	461	234.45
Indian Airline	A320	74	594	1.06%	11226.6	23760	16484	12,533.40
Finair	B757	114	50	0.09%	1260	2000	2138	740.00
Iran Air	AB3	200	96	0.17%	3024	7200	7200	4,176.00
Iran Air	B707	151	2	0.00%	63	113	113	50.25
Iran Air	B727	84	58	0.10%	1461.6	2320	1827	858.40
Iran Air	B737	84	2	0.00%	50.4	80	63	29.60
Royal Jordanian	A320	83	564	1.00%	14212.8	22560	17555	8,347.20
Royal Jordanian	B707	151	22	0.04%	693	1246	1246	552.75
Royal Jordanian	L1011	205	6	0.01%	226.8	461	461	234.45
Royal Jordanian	A310	135	80	0.14%	2520	4050	4050	1,530.00
Korean Air	A340	267	0	0.00%	0	0	0	0.00
Kuwait Airways	AB320	83	600	1.07%	15120	24000	18675	8,880.00
Kuwait Airways	A310	135	92	0.16%	2898	4658	4658	1,759.50
Kuwait Airways	B727	84	4	0.01%	100.8	160	126	59.20
Kuwait Airways	B747	392	14	0.02%	588	2058	2058	1,470.00
Kuwait Airways	A300	140	20	0.04%	630	1050	1050	420.00
Kuwait Airways	AB6	200	36	0.06%	1360.8	2700	2700	1,339.20
Kuwait Airways	A340	267	6	0.01%	226.8	601	601	373.95
Kuwait Airways	B707	151	6	0.01%	189	340	340	150.75
K.L.M	B767	156	710	1.26%	22365	41535	41535	19,170.00
Lufthansa	B747	392	106	0.19%	4452	15582	15582	11,130.00
MAC	C130	73	908	1.62%	31411.8	36320	24857	4,908.20
MAC	C5	8	54	0.10%	680.4	2160	162	1,479.60
MAC	C137	155	45	0.08%	1417.5	2616	2616	1,198.13
MAC	C141	144	143	0.25%	4504.5	7722	7722	3,217.50
MAC	B757	100	118	0.21%	2973.6	4720	4425	1,746.40

MAC	MD11	284	6	0.01%	226.8	639	639	412.20
MAC	DC10	264	18	0.03%	680.4	1782	1782	1,101.60
MAC	C135	138	15	0.03%	472.5	776	776	303.75
MAC	DC9	55	29	0.05%	548.1	1160	598	611.90
MAC	TRI	212	16	0.03%	604.8	1272	1272	667.20
MAC	KC10	258	65	0.12%	2457	6289	6289	3,831.75
MAC	DC8	161	114	0.20%	3591	6883	6883	3,291.75
M.E.A	A320	74	26	0.05%	491.4	1040	722	548.60
Monarch	AB600	200	568	1.01%	17892	42600	42600	24,708.00
Monarch	B757	100	314	0.56%	7912.8	12560	11775	4,647.20
P.I.A	AB3	200	156	0.28%	9891	11700	11700	1,809.00
P.I.A	B737	84	168	0.30%	4233.6	6720	5292	2,486.40
Tarom	B737	69	40	0.07%	756	1600	1035	844.00
Royal Brunei	B767	180	0	0.00%	0	0	0	0.00
R.A.F	CBO	75	246	0.44%	4649.4	9840	6919	5,190.60
R.A.F	HS25	12	93	0.17%	1171.8	3720	419	2,548.20
R.A.F	L1011	205	86	0.15%	3250.8	6611	6611	3,360.45
R.A.F	H125	10	33	0.17%	1171.8	3720	349	2,548.20
R.A.F	VC10	147	790	1.41%	24885	43549	43549	18,663.75
R.A.F	NIM	94	43	0.08%	812.7	1720	1516	907.30
Saudia	B737	84	254	0.45%	6400.8	10160	8001	3,759.20
Saudia	A300	140	46	0.08%	1449	2415	2415	966.00
Saudia	B747	392	20	0.04%	840	2940	2940	2,100.00
Saudia	TRI	205	124	0.22%	4687.2	9533	9533	4,845.30
Syrian Air	B747	392	10	0.02%	420	1470	1470	1,050.00
Syrian Air	B727	84	190	0.34%	5090.4	7600	5985	2,509.60
Syrian Air	TU154	100	2	0.00%	50.4	80	75	29.60
Turkish Airlines	B737	69	198	0.35%	3931.2	7920	5123	3,988.80
Turkish Airlines	A310	135	10	0.02%	315	506	506	191.25
Yemen Airways	B737	84	20	0.04%	504	800	630	296.00
Yemen Airways	B727	84	82	0.15%	2066.4	3280	2583	1,213.60
Cargo Flights	SW4	7	1354	2.41%	17060.4	54160	3554	37,099.60
Cargo Flights	F27	33	632	1.13%	7963.2	25280	7821	17,316.80
Cargo Flights	SW32	8	4046	7.20%	50979.6	161840	12138	110,860.40
Cargo Flights	B707	151	12	0.02%	302.4	680	680	377.10
Cargo Flights	BC190	80	2580	4.59%	65016	103200	77400	38,184.00
Cargo Flights	B727	84	2	0.00%	50.4	80	63	29.60
Private	SW32	7	459	0.82%	5783.4	18360	1205	12,576.60
Private	SW4	7	1047	1.86%	13192.2	41880	2748	28,687.80
Others	AN12	390	38	0.07%	1596	5558	5558	3,961.50
Others	B707	151	53	0.09%	1669.5	3001	3001	1,331.63
Others	B747	392	6	0.01%	252	882	882	630.00
Others	B757	100	64	0.11%	1612.8	2560	2400	947.20
Others	BN21	90	2	0.00%	50.4	80	68	29.60
Others	DC10F	264	6	0.01%	226.8	240	594	13.20
Others	IL86	210	4	0.01%	151.2	315	315	163.80
Others	MD11	284	4	0.01%	151.2	426	426	274.80
Others	SW32	7	2	0.00%	25.2	80	5	54.80
Others	TRI	205	2	0.00%	75.6	154	154	78.15
Total			44205	78.70%	0	0		0.00
	Actual Total		56169	100.00%	1636759	2332757		695998

Option Three Surcharge

Up to 120,000 Kg BD 40

Charge /1000Kg (Input) 0.375

Aircra ft type	MTOW in Tones	Charge per aircraft	No. of Mov. in one Month	No. of Mov. in one Year	Existing Charge per year	New charge per aircraft	Charge used	Charges Difference	New charge per year
A300	140	47.250	90	1080	51030.000	52.500	52.500	5.250	56700.000
A306	160	47.250	512	6144	290304.000	60.000	60.000	12.750	368640.000
A30B	160	47.250	37	444	20979.000	60.000	60.000	12.750	26640.000
A310	135	47.250	587	7044	332829.000	50.625	50.625	3.375	356602.500
A320	76	28.350	676	8112	229975.200	28.500	40.000	11.650	324480.000
A321	64	28.350	2	24	680.400	24.000	40.000	11.650	960.000
A330	212	56.700	102	1224	69400.800	79.500	79.500	22.800	97308.000
A340	267	56.700	256	3072	174182.400	100.125	100.125	43.425	307584.000
AC95	40	18.900	1	12	226.800	15.000	55.000	36.100	660.000
AEST	40	18.900	1	12	226.800	15.000	55.000	36.100	660.000
AN12	390	63.000	15	180	11340.000	146.250	146.250	83.250	26325.000
AN24	24	18.900	4	48	907.200	9.000	55.000	36.100	2640.000
AN26	40	18.900	4	48	907.200	15.000	55.000	36.100	2640.000
AN72	40	18.900	1	12	226.800	15.000	55.000	36.100	660.000
AT42	17	18.900	2	24	453.600	6.375	55.000	36.100	1320.000
B701	160	47.250	3	36	1701.000	60.000	60.000	12.750	2160.000
ATLA	60	28.350	1	12	340.200	22.500	55.000	26.650	660.000
B190	60	28.350	77	924	26195.400	22.500	55.000	26.650	50820.000
B350	40	18.900	7	84	1587.600	15.000	55.000	36.100	4620.000
B703	160	47.250	49	588	27783.000	60.000	60.000	12.750	35280.000
B707	151	47.250	40	480	22680.000	56.625	56.625	9.375	27180.000
B721	100	37.800	13	156	5896.800	37.500	55.000	17.200	8580.000
B722	100	37.800	50	600	22680.000	37.500	55.000	17.200	33000.000
B727	84	37.800	96	1152	43545.600	31.500	55.000	17.200	63360.000
B732	60	28.350	5	60	1701.000	22.500	55.000	26.650	3300.000
B733	60	28.350	39	468	13267.800	22.500	55.000	26.650	25740.000
B734	60	28.350	67	804	22793.400	22.500	55.000	26.650	44220.000
B735	60	28.350	16	192	5443.200	22.500	55.000	26.650	10560.000
B737	84	37.800	24	288	10886.400	31.500	55.000	17.200	15840.000
B73A	60	28.350	1	12	340.200	22.500	55.000	26.650	660.000
B73B	60	28.350	38	456	12927.600	22.500	55.000	26.650	25080.000
B741	320	63.000	86	1032	65016.000	120.000	120.000	57.000	123840.000
B742	320	63.000	206	2472	155736.000	120.000	120.000	57.000	296640.000
B743	320	63.000	274	3288	207144.000	120.000	120.000	57.000	394560.000
B744	320	63.000	304	3648	229824.000	120.000	120.000	57.000	437760.000
B747	392	63.000	313	3756	236628.000	147.000	147.000	84.000	552132.000
B74A	320	63.000	1	12	756.000	120.000	120.000	57.000	1440.000
B74B	320	63.000	3	36	2268.000	120.000	120.000	57.000	4320.000
B74F	320	63.000	21	252	15876.000	120.000	120.000	57.000	30240.000
B74S	320	63.000	15	180	11340.000	120.000	120.000	57.000	21600.000
B752	100	37.800	13	156	5896.800	37.500	55.000	17.200	8580.000
B757	100	37.800	23	276	10432.800	37.500	55.000	17.200	15180.000
B762	160	47.250	11	132	6237.000	60.000	60.000	12.750	7920.000
B763	160	47.250	340	4080	192780.000	60.000	60.000	12.750	244800.000
B767	156	47.250	112	1344	63504.000	58.500	58.500	11.250	78624.000
B772	250	56.700	455	5460	309582.000	93.750	93.750	37.050	511875.000
B773	250	56.700	14	168	9525.600	93.750	93.750	37.050	15750.000
B777	230	56.700	212	2544	144244.800	86.250	86.250	29.550	219420.000