

UNIVERSITY OF BAHRAIN
COLLEGE OF BUSINESS ADMINISTRATION

THE GULF TELECOMMUNICATIONS INDUSTRY
"COMPETITION ERA"

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BY

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partial fulfilment of the requirements for the
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PREFACE

This study examines a pragmatic question as to whether the onset of a competitive environment in the Gulf Region Telecommunications Industry has led to an increase in the propensity towards innovation of the (PTT's) therein, and betterment of their performance, as well as to identify and rate the quality of service - factors of most concern, to users of International Communications Services and finally to highlight the business opportunities for Bahrain Telecommunications Company (Batelco) in the International Services Field.

The study was motivated by two factors. Firstly, several nations in the world have undertaken measures to liberalize and open their economies. Secondly, literature dealing with the impact of the environment on PTT's performance had primarily adopted a variance approach, merely accounting for alteration in (PTT's) performance. However, we adopted a process approach, where in we tried to explain the difference in PTT's performance by developing a theoretical framework which included causal relationships between environment and performance.

Primary data were obtained through individual interviews using questionnaires for 120 key customers mainly those using International Services such as Leased Circuits, Message Switching in the six Gulf States divided evenly.

Data were presented in tabulated formats and analysed through high Framework Techniques using the Data Envelopment Analysis (DEA) methodology.

The findings indicate that increasing competitive pressure leads to better performance, and that change from a deregulated to a competitive environment meant that firms were now operating in a market where their customers could shift to other service providers. Further indications were that in the transition from a regulated industry to a competitive one, there would be massive organizational culture change as the telecommunications PTT's adjusted from the "quiet life" of monopoly to an aggressive market oriented environment.

The main recommendations include an urgent review of Batelco Strategic Marketing towards the Key Customers using International Services and Further more, keeping a close monitor on the strategic moves of rivals within the Gulf Region. This is because, the Telecommunication Industry is one of the main factors that investments, firms and business entrepreneurs contemplate on before starting operation physically. The Final recommendation was to enhance the competitive strategies towards the Key Customers by elaborating very Effective strategies to appeal their requirements and to place them in a rival attitude among their competitors. Competing in the market place is like war, you have injuries and casualties, and the best strategies win. (Collins: 1978).

DEDICATION

To My Family.

ACKNOWLEDGMENT

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CHAPTER 1

1.1 : Introduction

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1.3 : The Telecommunications Industry and the
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1.4 : The General Conceptual Background
to the Study

1.5 : The Scope of the study

1.6 : Brief Synopsis of the Chapters that Follow

1.1 : Introduction

Government control over economic activity has undergone major shifts in the last decade, and privatization and deregulation are two forms of economic performance of the industries concerned. Key policy questions underlying these mechanisms, whose intention is to enhance competition, are, will they bring about market allocative efficiency, provide what the consumer wants, and spur firms to become internally efficient? (Vickers and Yarrow, 1988; Paul, 1988)

The nature of changes brought about by such liberalization, alters the competitive environment of firms, affecting the incentive structure of their employees. Increasing competition within an industry, it is assumed, is a means towards eliminating inefficiencies in firms, particularly monopolistic ones (Camanor & Leibenstein, 1969; Hart, 1983). Assuring a competitive spirit is also an effective method of stimulating change and modernization, as competition is thought to be a compelling force for firms to restructure outmoded ways of doing things, introduce new products or services for new markets, and competition is taken to be a serious policy tool for industrial development (Frischtak, Hadjimicheal and Zachu, 1989;5).

liberalization measures is: Why should there be differences in the performance of firms in liberalized versus regulated environments, particularly where the same persons who managed the old regulated firms, are in charge in the liberal regime (Kay and Thompson, 1986: 19)? An apt answer to that is Liberalization, through enhancing competition, changes the nature of firm's environment.

The environment of the firm establishes the context in which its activities are carried out, and the performance outcomes attained. Performance changes are thus brought about not because of any sudden innate change in the abilities of the incumbent management, but because of the changing nature of constraints and opportunities faced in a different context (Prescott, 1986). Liberalization removes legally enacted barriers, lowers mobility barriers for existing firms, and allows greater discretion to individual firms to make their decisions on products, pricing and Geographical location.

Given that people in organizations behave in ways perceived to be in their self-interest and avoid actions detrimental to it, in regulated or monopolistic situations, market power allows the maximization of one's own welfare, as measured by salaries, the firm's size growth, or its public esteem and reputation. Non-competitive markets allow the attainment of such alternative goals, as opposed to meeting the principle

goals of customer satisfaction and profitability which a competitive market treats as paramount (Key and Thompson, 1986; Vernon and Wertzel 1989).

A competitive environment works by changing the incentives for bettering performance. Encouragement to do so come from the product market. In the product market, customers can change allegiances to rivals, and in the capital market, the threat of takeover imposes discipline on firms. When product markets are competitive, low efficiency is penalized by falling market shares, low profits, and withdrawal of unsuccessful firms. If capital markets are equally efficient, then below-average corporate performers are also likely to find themselves subject to takeover in the "market for corporate control" (Manne, 1965).

1.3: The Telecommunications Industry and the Objectives of this Study:

In Telecommunications Industry, a major restructuring is underway, particularly after the break-up of the Bell System monopoly in the United States, permitting the entry of competitors in various market sectors. A visible change is that industry boundaries have become blurred and telecommunications is no longer the provision of communication paths but the provision of enhanced communications with computer technology (Brock, 1981).

An explosion of technology has obliterated the original basis of regulatory barriers, and simultaneously profit opportunities have grown. Pressure on regulatory commissions has increased potential competitors seeking entry, and over a sustained period of time, competition has been intensified in what was once, the Bell monopoly market for telecommunication service (Faulhaber, 1987).

Given such dynamic natural experiments taking place in what was once thought to be a traditional public utility, the principle question addressed is: Has the "cold shower" from a competitive environment, brought about through several deregulatory moves, impacted on corporate performance in an industry once basking in the "warm sun" of Monopoly?

The objectives of these study are three fold:

Firstly, to investigate cross-sectionally whether telecommunication service firms exposed to a relatively more competitive environment perform better and are more inclined towards innovativeness than firms exposed to less competitive environments? Secondly, to evaluate whether telecommunication service-firms give a better performance and are inclined towards innovativeness in recent times, as a result of the onset of a competitive environment in the industry? Thirdly, to indicate the business opportunities and establish implementation strategies for Batelco among other rivals in the Gulf region.

1.4 : The General Conceptual Background to the Study:

Monopoly is a market structure recognized as causing loss of consumer welfare through permitting inefficiencies. An early estimate of such losses, however put its relative magnitude at only one-tenth of one percent of GNP, and suggested there were inefficiencies associated with monopolies (Harberger, 1954). Building on the above evidence, a later study formalized the notion, that if competitive pressures, not faced in a monopolized environment, were to be increased, cost reductions would be greater than the gains in allocative efficiency (Leisenstein, 1966).

The previous view suggested that monopolistic markets tend to operate at higher marginal costs than firms in competitive markets. This causes not only allocative inefficiencies, but a greater welfare loss through higher cost levels which are brought about by slackness in operations and an unwillingness to be in touch with the times. The latter is the phenomenon of x-inefficiency; as the originator of the term states, "cost reduction that is essentially a result of improvements in x-inefficiency, is likely to be an important component of the observed residual in economic growth" (Leibenstein, 1976;46), and he contends that a lack of motivation to fully exploit economic opportunities, makes

inefficiencies in production the norm, rather than the exception.

X-inefficiency theory assumes that firms and their members often pursue complex goals other than those of profit maximization, and according to Leibenstein (1978:329) "a central facet of my model is organizational entropy, which implies a cost-rising tendency that management has to struggle against. The essence of the entropy phenomenon is that effort decisions become less and less directed towards presumed management objectives and cost rises as a consequence."

The phenomena arises when the environment does not provide incentives for the firm to minimize costs, or is sufficiently benign so as to permit relatively easy maximization of revenues, thus allowing for reduction in organizational efforts and leading to x-inefficiency. The degree of environmental tightness, then, determines the level of firms performance; the more permissive the environment, the greater is the degree of x-inefficiency.

1.5 : The scope of the study:

In this study we are concerned with analyzing whether the onset of a competitive environment in the telecommunication industry in the Gulf region has made (PTT's) in general, perform better. Five propositions explaining how a competitive market structure impacts on

a firm's propensity for innovativeness and their corporate performance are derived to carry out this analysis. The detailed propositions are listed in chapter three. They have their logical foundations in the assumptions of X-efficiency theory, and descriptions of structural and process characteristics associated with a competitive market.

We use these propositions to make three major points.

First, we advance a view that telecommunication-firms which operate in environments with a high competitive potential or have high competitive exposure will have greater levels of propensity for innovativeness, in comparison with those firms which are not exposed to such competitive environments.

Second, we suggest that firms operating in such competitive environment will have higher levels of corporate performance than those firms not doing so. Corporate performance can be measured in a multitude of ways, and we choose two, based on revenue maximization and cost minimization criteria.

Third, we put forward the idea, that liberalization and deregulation causes changes in these firms' competitive environments, as a result of which, their propensity for innovativeness will be increased in time, and their corporate performance improve as well.

We validate these propositions using as our context the local telephone operating companies (PTT's), within the Gulf Region for the periods 1980 to 1990. During this time there was a gradual unleashing of competitive forces in areas such as Private Line and Business services, as well as the International services.

We adopted a two-stage method in validating our propositions. First, we used a technique called Data Envelopment Analysis (DEA) to calculate relative measures of corporate performance for each operating (PTT) over the period 1980 to 1990. We compared the performance of each (PTT) relative to its own performance over time, to other (PTT's) in the same time period, and to do the performance of other (PTT's) over time.

Thereafter, we used the DEA generated measures of corporate performance and a variable to measure the firms' propensity for innovativeness as dependent variables in a series of multiple regressions. We used a variety of independent variables to capture dimensions of market structure and the competitiveness of the firms' environment, and attempted through their use, to explain the impact of exogenous forces on the propensity for innovativeness and the corporate performance of local operating companies.

1.6 : Brief Synopsis of the Chapters that Follow:

This study is organized according to the following chapters. In chapter two, we carry out a survey of the literature that addresses issues of competition and firm performance. We look at theoretical literature that shows of how competition impacts on the firm's performance, how regulated environments are different from unregulated ones, and how market structure influences innovative activity. Thereafter, we look at several strands of empirical literature under the common theme of how exogenous forces impact on firm performance. Such literature comes from several sources, and while not all of them are based on notions of X-Efficiency, their general conclusions provide a substantial justification for the study that has been carried out.

Chapter three is the setting for the deductive derivation of these propositions. We analyzed in detail, the basic assumptions of x-efficiency theory, so that we could extract its salient features, that would help us in building our theoretical framework. We then analyzed the structural and process characteristics that underlay this, and helped define a competitive environment. Thereafter, we link these characteristics with the salient components of x-efficiency theory and arrive at our own theoretical framework. This framework is then used to generate the

five propositions that provide the basis for undertaking the empirical study.

In chapter four we analyzed the GCC telecommunications industry in detail. We describe the history of the industry, the nature of services provided within it, salient market characteristics which influence demand for these services, the changing nature of technology which has influenced deregulation, along with questions such as the existence of natural monopoly, and list the major deregulatory? in the industry. The contents of this chapter, provide a setting for the issues that are explored in detail, in the following chapters.

In chapter Five, we describe the design of the research. The research strategy adopted is outlined, and we have detailed descriptions of the DEA and the regression procedures that we use. The chapter also contains a conceptual discussion of DEA and the various regression techniques. We outline the empirical context of the study, the data required and used for our various procedures and the general forms of the regression equations that we estimate. A discussion of why we used specific measures to present specific independent variables is also contained in this chapter.

In chapter six, we present and analyze the result of our empirical research in detail. In this chapter, we tabulated the corporate performance scores, generated using DEA, and have a discussion on how and why they have turned out the way they have. This discussion is augmented by a series of mini-case analysis that shed light on the performance of each operating (PTT) that we have studied in the telecommunication industry. In this chapter, we also tabulated the results of the various regressions that we ran into, and discuss them.

In chapter Seven, we integrate the results, in detail and discuss our outcome in the previous two chapters, with the rest of our work. We discuss our overall findings and the validity of the propositions put forward. Thereafter, we use the postulates of the theoretical framework that had advanced, and empirical results generated by the study, to develop an inductive framework, which is evocative and descriptive, of the behaviour of firms when faced with a changing competitive environment.

Chapter Eight is the final, summing-up chapter. Therein, we discuss the implications of our results from the theoretical framework that we adopted, and crucially, what are the business and public policy implications arising from a study such as this.

We conclude by detailing certain features of the study, such as its limitations, contributions and the scope for future extensions.

One final note to be observed. There are Eleven figures and twenty two tables contained in this study, and they have been placed at each relevant chapter.

CHAPTER 2

- 2.1 : The Concept of Competition
- 2.2 : Regulation and Transition to Competition
- 2.3 : The Influence of Market Structure on Innovative Activity
- 2.4 : Preamble to the Empirical Evidence
- 2.5 : Studies on X-Efficiency and Market Structure
- 2.6 : Studies on X-Efficiency in Regulated Markets
- 2.7 : Studies on the General Impact of Regulation and Deregulation
- 2.8 : Studies on Regulation and Overcapitalizing
- 2.9 : Studies on X-Efficiency and Public vs Private Ownership
- 2.10: Studies on X-Efficiency and Ownership Form
- 2.11 : Studies on X-Efficiency, Technical Efficiency, And Management Quality
- 2.12: Studies on the Impact of Competition in the Telecommunication Industry
- 2.13: Market Structure and Innovation
- 2.14: Commentary

EXTERNAL FORCES AND PERFORMANCE : THEORY AND EVIDENCE**2.1 : The Concept of Competition:**

The notion of competition has taken two basic forms in theory. One is a descriptive term to characterize an idealized situation, for example, perfect competition. The second is that of a force-down through which prices are forced to their lowest sustainable level. This forms explains how macro allocative efficiency comes about.

These notions, however, have been concerned primarily with the exchange process, or determination of economic value. Yet, there are two primary economic institutions: organizing transforming and channelling resources for onward consumption, the firm and the market. Production, or the determination of physical form, take place within the firm but notions of competition have never been related systematically to firm dynamics or the costs of production.

By incorporating the latter notion theory, a competitive environment can be thought of as a spur to efficient operations. By establishing markets for factors of production where asymmetric bargaining advantage are minimized (Clark, 1961), by inducing entrepreneurs to

notice gaps caused by the inefficiencies of existing firms, and thereby filling them (Leibenstein, 1969), by altering employee expectations about the stability of the firms as a growing concern (Crew, Jones-Lee & Rowley, 1971; Stevenson, 1982), by having a role as an incentive system and discovery mechanism in a world of imperfect information (Vickers & Yarrow, 1988), by forcing managers to give up goals inconsistent with cost minimization such as expense preferences (Peel, 1974), by altering the pay-off matrix for undertaking research activities (Stiglitz, 1986b), and by not only shaping voluntary business decisions (Nelson and Winter, 1982), it can provide a general disequilibrium, behavioural force with meaning and relevance for contemporary reality (MuNulty, 1968).

The economic problem is different if we adopt a disequilibrium, behavioural approach. In traditional theory, choice sets are taken as given; the function of competition is to help to get signals and incentives right. In non-orthodox behavioural theory, choice sets may be unclear or not given and the consequences of choice unknown. Hence, there is diversity of firm behaviour, as firms facing the same market signals respond differently, making different product-markets, employee discretion and operational choices.

A competitive environment makes the above possible, that is allows the discovery of new combination of resources and the identification of idiosyncratic opportunities in return, and rewards the choices that prove good in practice and suppresses the bad ones. The outcome is enhanced consumer welfare, the existence of productive firms (Nelson and Winter, 1982; Rumelt, 1987), and the evolution of market structures as a consequence of competitive search for the most efficient means of producing goods and services (Neumann, 1988).

2.2 Regulation and the Transition to Competition

There are certain characteristics of a competitive market environment, that no one firm can be said to bear a direct responsibility for industry performance, and each businessman can thus afford to take the risks of large losses with the hope of large gains and to upset the status quo. Indeed, competition, forces businessmen to behave in this "irresponsible" fashion, if they are to prosper and survive (Kahn, II, 1988:2).

Such characteristics, however, often call for regulation, particularly in structurally competitive industries. A motivation for such regulation is to eliminate uncertainties about prices, sources of supply and market shares, so that consumers can benefit as a result. Nevertheless, the predictability of this kind of environment

can lead to several consequences, one of which is that although a regulated environment tends to reward mistake-free performance by not attracting negative public scrutiny, it does not reward outstanding performance (Zahac, 1988).

Another consequence relates to internal efficiency measures, or innovation. Where costs can be passed on because of adjustment policies, several poor operational policies are not penalized (Trebing, 1981). In the long run, a regulated firm cannot appropriate the gains from cost reductions, but neither does it suffer losses from any unsuccessful attempts. Regulatory rate-making ensures that gains or losses are passed on to consumers, and the effort of undertaking such measures is not made, as any gains or losses are not retainable (Agnew & Romeo, 1981).

Regulation imposes artificial constraints on decision processes which otherwise would be oriented towards cost minimization. Often a regulatory cap on rate of return may prompt firms to use more of an input than is economically justified. Averch and Johnson's (1962) classic piece, showed that because regulators calculated the allowed rate of return on the capital base, under tight regulation, firms would tend to employ more capital than labour, even though lower capital use would be consistent with minimization.

Westfield (1965) showed that a regulated firm had an incentive to purchase superfluous capital assets if its allowed rate of return was above its cost of capital and it could include these assets in the regulated rate base. And, in another extension of the Averch-Johnson model, to allow for the endogenous selection of innovations, Smith (1974) showed that the regulations which induced firms to over-capitalize would also induce them to select innovations to keep doing so, with the result that these induced inefficiencies would increase in grow over time.

Regulation also tends to keep 'inefficient firms' in business by providing rate structures covering their costs. For 'efficient firms' it is the opposite. By disallowing profits greater than the predetermined return as being potential rewards of monopoly, the possibility of earning returns from notable entrepreneurial achievements is precluded. If there is a profit ceiling and a guaranteed return available, incentives for management to gain through increased efficiencies are thereby reduced through regulation (Baumo and Klevorick, 1970; capron, 1971; Farris and Sampson, 1973).

Deregulation involves the substitution of the regulators, decisions by those of the consumers. The opening up of hitherto closed markets, allows entry by new firms, increases the competitive potential of the industry and

prompts older firms to reorient themselves in order to retain their market shares. Thereby deregulation allows full freedom of entry and as old regulatory practices do not continue to lead to motivational malfunctions, in the long run managerial efficiencies will increase, and slack will reduce (Selten, 1986).

2.3: The Influence of Market Structure on Innovative Activity:

The influence that market structure has on innovative activity has generated a debate for a significant period of time, with no clear conclusion emerging. The key issue in this debate has been whether it was a monopoly who primarily undertook innovative activities, or whether it was a competitive market structure that fostered them.

Traditionally, the starting point for this debate has been Schumpeter (1976) who argued that a monopoly would have greater incentive to be innovative, since its market power would enable it to profit from the innovations. However, another influential viewpoint was that of Arrow (1962) who argued that a competitive market would always provide more incentives for innovation than a monopolistic one, since a firm would be able to recover a price equal to the value of the cost reductions of the total output, which would be greater in a competitive market.

A monopoly, on the other hand, would be limited to the difference in profits earned before and after such innovations, and this would be less than what the competitive firm would make.

Demsetz (1969) argued that comparisons of incentives to undertake innovative activity provided by different market structures would be misleading without correction for differences in output. He showed that if the scale effect were compensated for, then given the smaller absolute market size facing it, a monopoly would have greater incentives to undertake innovative activity. Specifically, they suggested that the nature of demand, whether elastic or inelastic, would have significant incentive impacts. Where demand was elastic, incentives to undertake innovative activities would be greater.

Based on the above views, it can be suggested that monopolists in a regulated public utility, who generally face inelastic demand curves, will have low incentives to undertake innovative activities. However, where technological changes induce deregulation, and industries become greater since product diversification will increase the number of available substitutes. In such circumstances, the incentives to undertake innovative activity will be greater, for both monopolists and competitive firms (Meyer, Wilson, Baughcum, Burton and Caouette, 1980).

2.4: Preamble to the Empirical Evidence:

There is a wealth of evidence available on what impact competitive market structures or (de)regulation has had on firm performance. Some studies consider the postulates of x-efficiency theory explicitly, others implicitly. In the following sections, the key heads of classification are defined and studies discussed under those. Also included are x-efficiency studies based on other sources of pressure on standards of performance.

2.5: Studies on X-Efficiency and Market Structure:

A primary rationale underlying this category of research is that the degree of product market competition, where monopoly is treated as a case of low competition, is inversely related to the level of X-inefficiency. The following studies have generally concluded, on the basis of their evidence, that a lack of competitive exposure leads to x-inefficiency; and where competition exists in product markets, then firms operating in those markets are more efficient.

Bergsman (1974) undertook country level studies of the Brazilian, Malaysian, Mexican, Norwegian, Pakistani and Philippine economies to determine welfare losses caused by monopoly and x-inefficiencies generated through protection.

He found that protected economies were inefficient and open economies had generally better standards of performance, with lower levels of allocative inefficiencies.

Other studies were focused at a more micro level of analysis on the performance of firms within an industry, or the performance of industries within an economy. Clarlsson (1972) measured the efficiency of twenty-six Swedish industries to study the impacts of macro-economic variables and found that those industries exposed to foreign competition were more efficient than the ones not so exposed. However, a surprising finding was that a high level of industrial concentration led to a greater degree of efficiency, rather than the opposite expected result, suggesting that in a small country like Sweden large and dominant firms possessed economies of scale and specialization.

In a more recent macro-economic study, Cecen (1989) investigated whether an inflationary environment provided a relaxed, sheltered atmosphere for firms so that they could raise prices without competitive reprisals, as other firms would do the same thing, and there would be less regard for cost control. He found that there was negative feedback causality between productivity and inflation in the United States in the period 1970 to 1979, related to the presence of x-inefficiency as a macro

level phenomenon.

In the context of Indian industry, Katrak (1980) examined the impact of foreign trade on price-cost margins and found that high concentration, high tariffs and low levels of import and export reduced efficiencies. Lecraw (1977) studied the extent to which competition increased x-efficiency, this statement tends to confuse, among 400 light manufacturing firms in 12 Thai industries. He found that lesser competition led to greater slack and inappropriate use of technology, while it was competition, and not more the use of optional technology, that led to x-efficiency. In a similar vein, Martin and Page (1983) looked at the logging and saw-milling industries in Ghana to determine what impact public subsidies and managerial endowments had on firms' performances, and found that, given similar levels of managerial endowments and information, subsidized firms were x-inefficient.

A question of a slightly different nature was investigated by Shaphered (1972), who tested whether higher market shares led to higher profitability among a sample of two hundred and thirty firms from the U.S. Fortune 502nd list. He found that after a point, with higher market shares, profits declined as x-inefficiencies of size set in, and a crucial insight

was that an inverted U relationship existed between market share and profitability, an assertion also subsequently made by Katrak (1980).

In a study comparable to the others done in an international context, Tyler (1979) examined one hundred and sixteen plastic firms and twenty-two steel firms in Brazil and found that protection from competition offered to local industries firms made them more inefficient compared to foreign firms operating in Brazil who were not given such protection. Finally, White (1976) analyzed thirty-one industries in Pakistan to examine whether industry concentration and protection led to the use of inappropriate production techniques with consequent impacts on their efficiency and found that lower concentration and exposure to competition in export markets led firms to use more relevant production techniques and greater levels of efficiency.

2.6 : Studies on X-Efficiency in Regulated Markets:

A reason for regulation is natural monopoly, and a question that may arise in a "natural monopoly" like electric utilities is: Does the presence of another supplier in the same market lead to x-efficiency? A related question is: Does regulation, lead to x-inefficiency? The following study tried to answer these questions.

In the Electric Utility industry, Hollas and Herren (1982) set out to empirically estimate whether monopoly firms were allocatively inefficient and x-inefficient. They found that, of a sample of one hundred and ninety-seven public-owned utilities, those facing direct competition had a lower level of non-production costs. In the same industry Primeaux carried out two major studies. In the first one (1977) he examined whether electricity monopolies were less efficient than duopolies and found that competition reduced x-inefficiency, albeit in greater degree in smaller firms than larger ones. In the second (1978) he investigated whether the presence of competition for electric utilities led to lower or absent levels of sub-optimal capital expenditures, such as the creation of excess capacity, and found that competition and x-efficiency called for higher capacity utilization.

In what is perhaps the only major study of U.S. airlines in the pre-deregulation period, Pustay (1978) set out to examine whether external monitoring by regulators made firms more x-efficient, or whether regulation induced x-inefficiency through protection from competition. By looking at the performance of eleven airlines over a ten-year period from 1965 to 1974, he was able to show that x-inefficiencies existed and cost-

saving of 12 to 15 % could be achieved if all firms were as efficient as the most efficient one.

Finally, in another study of electric utilities, Stevenson (1982) examined whether differences in competitive pressures were systematically associated with differences in relative efficiencies. He found that, for the twenty-five purely electric and fifty-four gas and electric combination utilities examined, efficiency was high when there was competition pressure, and additionally dynamic x-efficiency was stable over time.

2.7 : Studies on The General Impact Of Regulation and Deregulation:

While not explicitly articulating notions of x-efficiency, these studies are closely allied to ones dealt with so far. In general the questions asked were: Does deregulation make an impact on firms, performance and productivity, and Does regulation make an impact on firms, performance and productivity, and Are regulated firms more inefficient than similar deregulated firms? A comprehensive study was carried out by Bailey (1986) to examine the consequences of deregulation in terms of the emergence of new products, the removal of cross subsidies and cost minimizing behaviour by firms. She found, that in the four industries studied, which were breaking airlines, rail and truck transport and

telecommunications, prices had fallen, consumers had more choice of products and services and productivity had risen following deregulation.

More industry specific studies abound, particularly with regard to the transportation sector, and the U.S. airlines industry has generated a great deal of evidence regarding the consequences of deregulation. A view taken was that as the airlines industry was structurally competitive it permitted easy entry and exit, both of which were characteristic of a contestable market. Bailey and Graham Kaplen (1985) studied the U.S. airlines industry in the period between 1971 and 1981 to examine whether deregulation led to increased productivity and lower costs. They found that increased competition induced changing to efficient planes, and structural changes brought about in a regulated environment induced operational ones which led to higher load factors, and increase in aircraft utilization, seating density and stage length. The contestable markets, hypothesis was, however, not the only factor, as several other factors, such as control of gates, contributed to the ease with which the market could be entered.

A different question was asked by Caves, Christiansen and Swanson (1981) with regard to the comparisons between U.S. and Canadian railroads over the years 1956 to 1974. They sought an answer as to whether there would be

a difference in the performances between those firms who operated in a regulated environment (U.S.A.) and those firms in an unregulated one (Canada). Their results show a dynamic betterment of performance of canadian railroads in that period. In the mid 50's canadian railroad productivity was lower than that of the U.S. ones . However, between 1956 and 1963, canadian railroad productivity increased at a greater rate than that of U.S. ones, and in between 1963 and 1974 this rate doubled. Their explanation was that there were regulatory changes in Canada during these periods and the typical railroad became at least ten percent more productive than its U.S. counterparts.

Three other studies in the airlines industry are to be noted. The first, by Caves, Christiansen and Trethawat (1983), asked ;Does the transition to a deregulated industry structure increase total factor productivity? They looked at U.S. airlines in the period 1970 to 1980 and found that productivity growth increased from 2.8 percent per annum to 5.2 percent per annum in the post deregulation period, and that the smaller firms did better than larger ones. In the second, Graham , Kaplan and Sibly (1983) tested whether regulation induced excess capacity creation, and whether potential competition helped to reduce fares, even in concentrated markets.

They found that load factors had risen in the post deregulation era, suggesting that capacity was being better utilized; however, competition did not have a significant effect on fares reduction in concentrated markets. Finally, Morrison and Winston (1985) studied the impact of airline deregulation on firm's profitability and consumer welfare by looking at firms in the period of 1977 to 1983. They found that there was a significant increase in load factors, improvements in scheduling, and that on an average, airline profits had increased by two and a half million dollars per year as a result of change induced by deregulation.

2.8 : Studies on Regulation and Overcapitalizaion:

Allied to the issue of deregulation, is the Averch-Jonson thesis that rate-of-return regulation leads firms to invest in excessive amounts of capital stock, more so than that is required according to the economics of production in the industry, as the allowed return is based on capital invested. The following studies, each using a different estimation technique, have been carried out in the electric utility industry and find no evidence to disprove the thesis.

Courville (1974) employed an estimated production relation to compare the ratio of the marginal products of inputs to the ratio of their prices. A test of equality between these ratios would confirm distortion in

input choices. Spann (1974) used a method to estimate the Lagrangian multiplier for the rate-of-return constraint and test whether the value was between zero and one, under effective regulation. In both these papers, the proposition was that a regulated monopoly would use a ratio of capital to other inputs which would be larger than the cost-minimizing ratio, and both studies confirmed this proposition.

Peterson (1975) developed a statistical cost function, giving a comparative statistical model of a cost minimizing firm which operated, subject to a rate of return constraint. He found that the effect of heightening regulation led to increased distortion in the choice of inputs. And finally Hayashi and Trapani (1975) employed a model estimating the implicit demand function for the firm's choice of capital and labour in production. This allowed testing of the related propositions that the ratio of a regulated monopolist's capital to labour increased, if the rate of return were to be decreased.

Again, evidence was found for the Averch-Johnson thesis that stringent rates of return regulation led to a greater capital-labour ratio than required, and distortions in the firm's choice of inputs.

2.9 : Studies on X-Efficiency and Public vs. Private Ownership

A popular assumption often made, wrongly as is shown, is that public sector firms are likely to be x-inefficient compared to private sector ones, because they can be subsidized through tax revenues. The following studies, some of which are not explicitly x-efficiency based, show that it is the nature of the firm's exposure in a competitive market, whether its operations are run with regard to market incentives and it possesses a commercial orientation that determines efficiency, not whether it is a government department. The issue of public or private ownership, then, becomes irrelevant.

In a comparative study of privately owned and publicly owned water utilities, Bruggink (1982) investigated whether public firms were less efficient than private ones. Looking at various factors that influenced operating costs, he found that public utilities were, in fact, more efficient than their private counterparts. This was especially so when the regulatory, climate variable was removed, and regulations tended to add costs to the utilities' operations.

A study, with a similar question, was carried out by Caves and Christiansen (1980) who compared total factor productivity between a public Canadian railroad and a private one. They found that the public railroad was as

efficient as the private one, if not more so, and though the ownership structure was not material, the incentives provided by a competitive market were.

A third type of public utility, i.e. electricity firms, were studied by Fare, Grosskopf and Logan (1985) who compared one hundred and twenty three private with thirty public utilities. They found that the public utilities were more efficient than the private ones in general. Public utilities were technically more efficient than the private ones, though both types were equally inefficient in allocative terms. However, public utilities were not scale efficient compared to private ones.

In a slightly different context, Gillis (1982) carried out a study of tin mines in Bolivia and Indonesia to find out what were the criteria of the efficiency in the public sector, and what factors had an impact on these. He found that bureaucratic practices hampered the public sector firms, unlike the presence of clear-cut production incentives which made private sector firms quicker and much more efficient.

2.10 : Studies on X-Efficiency and Ownership Form:

Related to the previous topics, is the issue of separation of ownership and control. Where firms are owner-controlled, there are direct stakes in its performance and inefficiency is unlikely to be tolerated. Where firms are manager-controlled, the distance between managers and the ultimate owners is likely to breed inefficiencies, and the maximization of other functions besides profit. The following studies bear this out.

Junanker (1976) studied the operations of a sample in India to find out whether the ownership of farms increased total output from the land. Looking at the output of wheat per hectare, he found that ownership increased x-efficiency, and in the larger farms where there was a greater ownership proportion, output was greater. However, size per-se was not important in determining output differentials.

In the first empirical x-efficiency study, Shelton (1967) had compared the operations of fifty units of a national fast food chain, some of which were franchise owned and operated by the company's manager. His interest was in determining whether ownership made any difference in the performance of identical business units. He found that the franchise-owned units had made bigger profit margins and sales growth compared to the company-owned ones.

When there was a change in ownership from company-owned to franchise-owned, the pattern of profit margins and sales growth also changed.

And in another study based on Indian data, Yotopoulos and Lau (1973), examined the various factors influencing price and technical efficiency at farms. They found that small farms were technically superior to larger ones. Findings showed that smaller farms tended to be owner operated, and hence a greater level of supervision and leadership led to greater efficiency.

2.11 : Studies on X-Efficiency, Technical Efficiency and Management Quality:

While the other categories covered so far have dealt with exogenous factors and their impact, another issue is: Can x-inefficiency be reduced through good management, education, information and use of the relevant available infrastructure, and will there be explanation for variations in observed technical efficiency? The answer is generally positive, as the following studies, set in driver's contest and using a wide range of research methods, show.

Page (1980) carried out a comprehensive study of two industries in Ghana, to seek a clarification of the relationships between managerial efficiency, choice of production techniques and economic performance. Some of the external factors he considered, were the level of managerial training and the number of expatriate managers

used. He found that these factors influenced the quality of management and had significant x-efficiency impact. In the contrast, Pitt and Lee (1891) generated different results for almost similar questions. They investigated the sources of firm's level inefficiency in developing countries, explicitly in Indonesia, and found that larger firms were more efficient than smaller ones, younger ones more efficient than older ones and local firms more than foreign ones. The latter's result in contrast to Page's, suggests that there may be macro socio-economic factors which affect x-efficiency in different contexts.

The role of modernization and information diffusion in leading to x-efficiency was investigated by Shapiro and Muller (1977) in Tanzania. They studied seventy-six farms and found that various dimensions that characterized modernization were significantly correlated with higher levels of labour productivity. However, there was a trade-off as the marginal productivity of land was found to be reduced. In a broadly similar perspective, Shen (1973) studied the causes of change in output's and input's usage for a sample of four thousand manufacturing firms in Massachusetts. He found that while technical change and scale economies could be used in part to explain efficiency increase, the diffusion of technology had to

be combined with x-efficiency explanations to fully explain changes in efficiency.

In a study of the entire mainland U.S. farming over the period 1960 to 1967, Timmer (1971) looked at the components of technical efficiency. While his study has generated some methodological controversy due to the procedure of the removal of outliers so as to reduce management bias, he found that tenant farmers were more efficient. This is a different conclusion to the ones reached by both Junanker (1976) and Yotopoulos and Lau (1973) and a possible explanation may be that there are differences between developing and developed country institutions and land markets, so that U.S. tenants are more motivated by a desire to save up, to eventually buy their own farms.

Finally, in a much-quoted study, Wells (1984) undertook a comprehensive study of six industrial sectors in Indonesia, looking at forty-three firms in total. His aim was to analyze determinants of managerial behavior which influenced technology choice in a low wage, developing country, and the terms he used to describe managerial behavior as "economic man" versus "engineering man" has now become a standard part of his literature. His findings showed that in a monopolistic situation, it was mostly the engineering man that prevailed, who would go for the best, sophisticated technology available, with no

regard to cost minimization, even though labor intensive technology would have been more apt for the circumstances. However where, competition was evident, the economic man dominated with a clear motivation to choose the most appropriate technology and minimize costs.

2.12 : Studies on the Impact of Competition in The Telecommunications Industry:

Because of telecommunication liberalization in a recent world-wide phenomenon, there are very few empirical studies on its impact. The studies available to hand are all unpublished. However, their findings are both interesting and significant.

Perl (1988) looked at how competitive pressures altered both the regulatory patterns and price structure. His findings showed that several states had shifted from strict rate of return regulation, with its negative consequences, to a social contract mode of regulation, and that some states also permitted rate flexibility in competition. As a result, toll prices had fallen, while local prices had risen. These reflected the pressures to move rates closer to costs.

The composite effect of price structure changes since 1984, were to lower charges for both residential and business subscribers. Savings from lower-toll rates more

than offset rising access charges, while price structure had little impact on the percentage, of households subscribing to telephones. In addition, by aligning costs and prices, these price-changes increased allocative and consumer welfare. The welfare benefits were also found to be evenly distributed, with all-income groups experiencing similar percentage increases, and low-income consumers were found to have slightly higher percentage increases than those of higher incomes.

A different question, and approach, was adopted by Oniki, Oum and Stevenson (1990) in a study of the productivity performance of NTT (Nippon Telegraph and Telephone Company), the dominant provider of telecommunication service in Japan. NTT is Japan's largest corporation and the world's largest telecommunications company, with over forty-eight million subscriber lines. In 1985, NTT, which was a state run monopoly, was privatized and steps were taken to introduce competition into the Japanese telecommunications market.

In the study, the authors decomposed NTT's productivity growth into different sources such as the advent of competition, scale of output and technical change, but a particular emphasis was placed on identifying the effect of competition. First, the aggregate output and input

quantity indices were constructed for each of the three inputs, labor, material and capital, to measure total factor productivity. Thereafter, the growth in total factor productivity was decomposed using regression analysis, and trans-log functions were estimated to identify growth accounted for by technological innovations (measured by the use of direct dialing and modern switching), technical progress (measured by a proxy variable as the time trend for 1958 to 1987), and the extent of competition (again measured a proxy variable as the time trend for 1983 to 1987).

Depending on the choice of independent variables used for measurement, technical change influenced the growth rate of total factor productivity by .43% to 2.73% per year in the period 1983 to 1987. However, during the same period, the influence of competition led to a 2.14% to 2.69% per annum change in total factor productivity. These translated to a 11.2% to 14.2% growth in total factor productivity due to competition in the overall period.

In a broad range, Crandall looked at the impact of liberalization and divestiture on the productivity of U.S. telecommunications companies. He analyzed the annual growth in output, labor input, capital input and the total factor productivity of regulated telephone common carriers for the period 1961

to 1987, using a standard Tornqvist index of total factor productivity.

He found that estimated total factor productivity grew more rapidly in the 1971 to 1983 period than in 1961 to 1970, a period of no competition. Estimated total factor productivity declined in 1984-1985, the year of divestiture, which he attributed to the problems of data measurement likely to arise in a year of transition, or to inefficiencies caused by intra-firm problems of adjusting to a new environment. Thereafter, in 1986-1987 there was an acceleration in total factor productivity that was rapid in the pre-divestiture period, and more rapid than the growth that occurred in the 1970s.

2.13 : Market Structure and Innovative Behavior:

The studies reviewed so far have dealt with the primary question of whether exogenous forces have an impact on corporate performance. A secondary question was related to the impact of such forces on a firms' propensity for innovativeness. There is a significant amount of empirical literature on such an issue and the best summary source is perhaps Kamien and Schwartz (1982). However, no empirical studies on the telecommunications industry has come to light. A key theoretical anchor for such behavior is the "demand pull" hypothesis, according to which, economic opportunities exploit potential technological assets to provide the impetus for

innovative and entrepreneurial activity. Such a view is inspired by Schumpeter (1976) and empirically confirmed in Schmookler's seminal study (1966), where potential market openings and opportunities spark innovation; such innovation is then used to develop a strategy for competitive behavior by firms. After a magisterial synthesis of several major studies, the authors report that an inductive hypothesis which emerges is: a market structure which is intermediate between monopoly and perfect competition would promote the highest rate of inventive activity. Such a hypothesis not only negates a commonly-held view that monopoly begets innovative activity, but also points out that extreme competition can lead to wasteful expenditures, with low innovative content and impact.

2.14 : Commentary:

The empirical evidence does not equivocate that a competitive market has a positive impact on firm's performances. However, some studies have found the relationship is not as strong as one might expect, or that some hypothesized relationships empirically proved to be the opposite (Crlsson, 1972; Timmer, 1971). Nevertheless, each of the studies has focused on a particular dimension of the competitive environment, for example whether firms are exposed to foreign competition in import and export markets (White, 1979), or whether the market potential has increased

following deregulation, allowing entry by new firms (Graham, Kaplan & Sibley, 1983), or whether high industry concentration ratios exist (Shepherd, 1972), and how these dimensions are related to efficiency.

However, some gaps do emerge noticeably after this review. An important one is the very small number of major works addressing such issues in the telecommunications industry. Also, a point that emerges after reviewing traditional industrial organization literature is their focus on the concentration variable ignoring any effects that exposure to competition might have with respect to performance, leaving such issues to be tackled by development economists or regulatory economists. In industrial organization literature the issue of strategic behavior and responses to competitive threats are being tackled at theoretical level (Morris, Sinclair, Slater and Vickers, 1986; Stiglitz and Mathewson. 1986), however, relevant empirical works are still few and far in between.

Studies using an explicit x-efficiency perspective have tended to ask a static question: do differing degrees of competitive pressures among firm's account for differing degrees of firm's performances? In this study, a dynamic question has been proposed: what happens to firm's level of x-inefficiency, and its propensity for innovativeness, when a competitive environment has been

introduced in an industry? The static question, however, remains of interest.

In the next chapter, various views on efficiency and performance are described. An explanation of how x-efficiency theory works is given, and a set of propositions to confirm or deny the research questions is derived. In arriving at these, an account has been taken of the different structural and processual dimensions of a competitive environment.

CHAPTER 3

- 3.1 : The Various Notions of Efficiency
- 3.2 : The Basis of X-Efficiency and other Similar Perspectives
- 3.3 : Components of X-Efficiency Theory: External Forces and the Operational Mechanism
- 3.4 : The Structural Characteristics of a Competitive Environment
- 3.5 : Process Dimension Underlying the Structure of a competitive Environment
- 3.6 : The Impact of Competition on Corporate Performance : Integration of Concepts and a Diagram of the Logic Underlying the Propositions
- 3.7 : Competitive Potential and Firm's Performance Proposition One to Three
- 3.8 : Competitive Exposure and Firm's Performance: Proposition Four to Five

FIRM LEVEL ASSUMPTION, DERIVATION OR PROPOSITIONS AND AN OUTLINE OF THE MODEL.

3.1: The various Notions of Efficiency:

Economic efficiency is an important yet elusive concept, two major notions of which are allocative and technical efficiency. A firm attains allocative efficiency when it selects the optimum combination of inputs, given relative factor prices, and the marginal product of each resource used is the same in all alternative employment; in a macro context, allocative efficiency refers to resources allocation among all firms in the economy so that consumer welfare is maximized (Lau & Yotopoulos, 1971; Wolf, 1997). Technical efficiency refers to a firm's production of maximum obtainable outputs with the available factors. Such a firm could be price-efficient when, for its given maximum output, the cheapest input combination is used (Carlsson, 1972).

3.2: The Basic Nature of X-Efficiency and Other Similar Perspectives:

The basic underlying traditional notion of efficiency is that firms maximize profits, operate on most efficient isoquant, and sub-optimal operations are not possible (Leibenstein, 1982). X-Efficiency theory presumes that firms do not always minimize costs or maximize revenues.

Because of inadequate incentives, imperfect informations, and lack of control, sub-optimal operations are possible. While a firm may know what its production functions are like and is internally efficient in resources allocation, there is no presumption that functional units to which resources are allocated will use them efficiently. The difference between the maximal efficiency and actual efficiency of resource utilization is the degree of x-efficiency (Leibenstein, 1975).

Other similar views include Scitovsky's (1943) model and leisure maximization, Simon's (1974) notion of satisfaction, Baumol's (1959) model of sales maximization subject to a minimum profit requirement, Cyert and March's (1963) notion of organizational slack, Marris' (1963) model of growth seeking by firm's managers, and Williamson's (1963) model of managerial discretionary behaviour. These authors have questioned the basic assumptions underlying traditional neoclassical models, and shown that complex motivation mechanisms exist within firms, whereby differing objectives, other than one of profits, are sought to be maximized.

3.3: The External Forces of Competition and X-Efficiency:

There are two key components used in operationalizing x-efficiency theory. The first is discretionary efforts. This describes the fact that the individual in the firm

is presumed to have discretion over his work efforts. Within the constraints of the task environment, a range of effort is put forth, according to the job demands, interpersonal interactions, and the nature of vertical relationships in existence. Discretionary effort is positive in nature in that an individual employee can choose to be innovative, and not procedure bound, or may choose to work "according to rule". In general, the greater the challenge perceived from the effort to be expended, the greater the effort that will be expended.

The second is inertia. This describes the fact that, once an effort position exists for some time, an individual may not shift to a new position, even though there may be a gain or utility to be achieved, thereby the inertial cost of moving from effort position to another is larger than the perceived gain (Leibenstein, 1976).

These help to define another point, that of constraint concern. Economic situations involve opportunities for gain, subject to constraints. Constraint concern describes the degree of compromise with constraints that individuals take into account, which is compromise between the way they would like to behave if they had no sense of obligation and the pressures felt because of an obligation arising from internalized standards of performance and external pressures.

By increasing environmental tightness, standards of purposiveness can also be used, are likely to be raised by the firm's managers so as to reduce sub-optimal behaviour. Where standards are so raised, discretionary efforts are likely to be greater, and inertia likely to be reduced; as a result, constraint concern is likely to increase concomitantly with efforts and instances of innovative behaviour. The impact of this is to raise overall corporate performance.

Pressures from a competitive environment increase the standards of purposiveness within a firm. Initially such pressures operate through the price mechanism. To remain profitable when prices decline, costs have to be reduced. According to Leibenstein (1976:207), "the quest for such lower costs transmits itself to individuals, at various levels within the firm, whose sense of success requires that the firm stays profitable or at least solvent, and of whom it is believed, or who themselves believe, that they can influence costs".

Competitive behaviour enables the differentiation of markets, where higher prices are sustainable in several niches. Such opportunities act as a spur for the supply of entrepreneurial acts, as firms members see themselves "filling gaps" or "completing inputs" not done by others (Leibenstein, 1979). Where individuals are very

highly motivated, such forces act on discretionary efforts and spur entrepreneurial behaviour where the focus may be on revenue maximization; where motivation is not so high, such forces tend to reduce inertia and slack in operations, where the focus may be on minimization. Total organizational effort increases, since everyone in the firm can undertake discretionary effort, thus helping in determining total output, cost levels, the propensity for innovativeness and overall corporate performance (Leibenstein, 1979: 487).

3.4: The Structural Characteristics of a Competitive Environment:

To understand how competitive environmental pressures impact on corporate performance and develop the logic for our model, it is necessary to define the structural characteristics of such a competitive environment. A basic distinction is between external and internal market conditions.

The key external condition is defined as competitive potential. This describes the ability of the environment to generate pressures on firms. Such pressures are from firms outside the market who may try to enter, and influence either in part or whole by the changing nature of various exogenous variables. Even if there are relatively few

firms in an industry, there is the possibility of entry, given the changing nature of external circumstances. Thus, potential competition may be similar to actual competition in its effects. Changing circumstances may be due to technological characteristics, alterations which reduce barriers to entry and make industry boundary spanning easier for some firms, the characteristics of market demand, as revealed by the demographer (Stiglitz, 1986; Shepherd, 1984), the nature of the capital market, and the legal structure within which businesses operate (Dasgupta and Stiglitz, 1980).

Internal conditions embody the degrees of actual competition and monopoly in a market. Such conditions are both structural such as market share, and behavioural, such as the extent to which a firm may participate in a particular competitive market. These endogenous or internal conditions are determined by the exogenous or external ones (Stiglitz, 1986).

A competitive market can be analyzed in terms of the competitive exposure each firm has. This signifies the proportion of the firm's revenue that are subject to actual, or potential competition. It also reflects the strategic choices made by management in entering a particular market where the risk of exposure may be greater, but the returns commensurably higher. In terms

of resource dependency theory (Pfeffer & Salancik, 1978), this characteristic captures the firm's vulnerability to external influences. It is determined by the relative magnitude of exchange of such resources being subject to influence, and one of these may be customer revenues.

3.5: Process Dimensions Underlying the Competitive Structure of an Environment:

The structural characteristic of a competitive environment has an impact on performance because of certain process dimensions associated with them. The first of these can be classified as information properties. Competition enriches a firm's informations environment.

When there are firms providing essentially similar goods and facing similar fluctuations in output and input prices, each can use knowledge of the others' experience as a guide to its own actions. Every firm provides public help to its competitor; this is the information about its operational activities, to the extent that it is not a secret. Such activities may be in the nature of operational trials, or strategic experiments; every such trial or experiment by a firm provides information into the collective pool for all the others, about what impacts the measures generally have had. To the extent that as the number of competitors increase, so does this pool of information about their activities (McCain, 1975; Hart, 1983).

The second process dimension can be classified as employee signals. Under competitive conditions employees are implicitly informed that, in the absence of an increase in their constraint concern, potential unemployment is likely, because the outcome of a lack of active, on-the-job cooperation is enterprise failure. Such signals emanate not only from management to employees via vertical channels, but also from the general business environment (Crew, Jones-Lee & Rowley, 1971). Given that operational level employees make up the largest number in any firm, the pool of information that can exist internally, based on receipt of such signals, is going to be large, thus leading to appropriate work-level behaviour. Hence, employee signals also have simultaneous information properties, because they can be diffused quickly through the organization (McCain, 1975).

The final process dimension is externally focused and deals with performance expectations. This denotes the extent to which a firm can keep its customers and other principal stockholders satisfied; also relevant is the level and quality of the expectations of these stockholders from the firm. In the product market, control is ultimately exercised by consumers and by competition among suppliers. Where expectations are minimal, firms can often pass on increased costs, caused by inefficiencies, to customers.

Where technology makes products more standardized, relative/price differentials between competing firms are narrowed, and existing high cost firms are pressurized into cost saving behaviour (Frantz, 1988; Wolf, 1979). Performance expectations cannot be gauged by their relative differentials. Critically gauges the ability of the firm to function in the absence of the market, or the resources provided by the stockholders, and has a direct link with appropriate firm responses (Pfeffer & Salanick, 1978).

3.6: The Impact of Competition on Corporate Performance:
Integration of Concepts and a Diagram of the Logic
Underlying the Propositions:

We established the link between the structural characteristics of a competitive environment and corporate performance. What emerges is a set of propositions enabling us to ascertain the validity of our questions. Because we ask both a static and a dynamic question, the propositions derived cover both aspects. In deriving these, the process dimension of market structure dealt with earlier are integrated with postulates from x-efficiency theory so as to provide a logical explanation of phenomena. The theoretical argument underlying the propositions and the structural model, is Appendix B. The diagram is a general exposition

of the general logic underlying our derivation of the specific propositions.

3.7 : Competitive Potential and Firm Performance:
Proposition One to Three:

In a market with high competitive potential, the free pool of information on various strategies and tactics used by various firms has increased, particularly where demand is concerned. The complexity and change in such an environment can create a market for ideas; behaviour oriented towards providing new and innovative services which is a function of such information and ideas (Lawrence, 1987), and employees gain insight as to what their operational responses ought to be. In a Schumpeterian sense, this activates latent entrepreneurial spirits, increases the amount of discretionary effort that employees would expend in order to create new niches for the firm's products, and results in an overall increase in the firm's propensity for innovativeness. This also increases employees' personal benefits from the improved revenues in the organization and they can share in the gains brought about by external market shifts (Leibenstein, 1969).

Where competitive potential is high, employees are also signalled that there is greater likelihood of new

entrants into the market. These entrants are likely to have innovative product or service offerings and in a quest to gain market share, will use new operational methods. Such signals act on discretionary effort and inertia simultaneously. On one hand, administrative and procedural innovations are sought and discretionary effort is channelled towards this end, motivated by likely gains from using better and more efficient methods. Simultaneously, the potential loss of existing "rents" in the firm serves as an incentive to employees in deriving greater utility from the work effort, reducing inertia and waste and contributing to the firm's performance.

In industries that are becoming structurally competitive, relative profits will start getting squeezed. A low projection of profits might signal to firms that their choice of technology is critical if they are to have efficient operations. This gives each firm greater incentive to invest in more appropriate technology (Lecraw, 1984). Similarly, where technological progress is altering the nature of an industry, members of the firm therein may find that rather than resisting changes in firm practices and operations, they can enhance job survivability and future indispensability by being seen to be in favour of work related changes.

In a process of dynamic industry transition,

employees would be motivated to seek potential long term rents from their jobs by increasing their discretionary efforts and reducing inertia (Hoenack, 1989). Conversely, where technological progress is slow or fluctuating, signals may be weak enough to not increase the utility gain of undertaking additional effort; hence, employees may not overcome their inertia and alter ways of doing things (Leibenstein, 1977).

Huber (1990) decisively argues that the centre of gravity of telecommunication service providing firms have shifted, with the control of destiny going from their hands into that of the customers. They can now dictate what services they want, and if providers are unable to come up with these they can take their custom to other suppliers. Galbraith (1983) similarly argues that when monopoly control is in the hands of service providers, their internal orientation is "upstream" with an emphasis on network operations, engineering and traffic activities so that the system moves along. However, when control shifts to customers, then the orientation becomes "downstream" with an emphasis on being innovative and market driven, yet to remain operationally efficient.

Along with the technical and economic changes that have taken place in industry, several judicial, regulatory and legislative events over the past years

have served to shape the competitive potential of the environment. What was once a placid environment has become turbulent, evoking long term strategic responses and increasing the propensity for innovativeness (Smart and Vertinsky, 1984). Such responses may be to increase operational efficiencies; they may also be to invest in technologies which enable innovative and efficient services to be offered.

Given such factors, we offer the following as our first three propositions.

PROPOSITION ONE:

In general, telecommunications (PTT's) in the Gulf region, providing services in highly competitive potential environments, will have a greater propensity for innovativeness than those firms in low competitive potential environments. Such (PTT's) will also have greater levels of corporate performance as measured by their ability to maximize revenue and minimize costs.

PROPOSITION TWO:

In general, for (PTT's) providing telecommunication services, the increase in overall competitive potential within the Gulf region, will cause them to have optimum level of technology enhancement and highly services provider to differentiate them as dominant leader with growing customer base and customer loyalty.

PROPOSITION THREE:

In general, (PTT's) providing telecommunication services in a low-cost position relative to rivals have a significant edge in appealing to those buyers who are inclined to base their purchases decisions on low price; plainly, "a low-cost producer has the ability to exert a heavy hand in determining the industry's price floor".

3.8 : Competitive Exposure and Firm Efficiency:
Propositions Four and Five:

The impact that competitive exposure of a firm has on corporate performance is more complex since actual competition is at issue. The extent of the competitive exposure of a firm and its success or failure at making a profit in its environment, signifies to its members which pricing and operational strategies have been successful. Such signals make an impact on the discretionary efforts of employees by suggesting the need for alternative operational procedures, as earlier procedures may not have worked; alternatively if they did work, it is seen that the discretionary effort already put in has been successful and so more is warranted.

The extent of competitive exposure also sends to the employees signals that their employment is subject to greater risk, since the firm's revenue are subject to competitive pressures and to the dangers of customers switching allegiances. Such signals create an impact on discretionary effort by suggesting the need for operational efficiency and flexibility through process innovations as saving from these, and not increasing revenue through price increases, is going to yield profits.

They also impact on inertia since the waste elimination is likely to increase efficiency and diversion of resources by employees is going to be less permissible.

Similarly, in the adoption of new technologies which permit customer-focused entrepreneurial activities, the extent of competitive exposure faced by a firm can explain the occurrence of the "push" process, or the presence of pressures created by adopting firms on non-adopting firms. Such pressures tend to increase the propensity for innovativeness of a firm (Leibenstein, 1969).

Where new technologies permit innovative types of service offerings, a non-adopter can lose out in several ways. Its cost may be higher than that of adopters, and its profits and market shares may decline. Such impacts can be exacerbated by a high level of competitive exposure. Hence, its employees, perceiving a reduction in jobs, promotions and advancement opportunities, will support the adoption of the new technologies involving differing working practices, so that the firm remains competitive.

As a firm's competitive exposure increases, or is high relative to other similar firms, its profits and cash flow are likely to become more volatile, unlike in a regulated environment where steady revenue and profit streams can be taken for granted.

The performance expectation of its various stockholders, not just its customers, are likely to become more stringent in such circumstances. As the volatility and variability of returns increase, it is expected that existing operational slack and resources wastage will be eliminated so as to ensure financial stability. Such expectations are primarily going to have an impact on firms members' inertia, by providing incentives to reduce waste, improve performance and ensure the continuance of the firm. As a result, the social psychology of behaviour associated with an abundance of resources is likely to alter. Where earlier the economics of affluence did not inspire cost cutting, now, striving for optimal resource utilization will have a higher priority (Lawrence, 1987).

In the Gulf state, telecommunications industry technology and the opening up of new areas of business following liberalization, has meant that firms serving monopoly markets are subject to competition from various quarters. This is particularly so in business sectors, where several types of alternative services are being offered, and the centre of gravity of telecommunication firms has shifted. Areas of business, earlier well-insulated from competition, are now being subject to significant competitive pressures. In the light of such factors, we offer the following two propositions.

PROPOSITION FOUR:

In general, (PTT's) providing telecommunications services in highly competitive potential environment, differentiation strategies based on technical superiority, quality, customer support services, appeal for more value for the money will create a competitive advantage among other rivals on the Gulf region.

PROPOSITION FIVE:

In general, the opportunities and challenges will be on hand of those (PTT's) which fundamentally secure most of the features of highly advanced telecommunication infrastructure and can play major role in other sector business, which will represent a high value of business to them and can differentiate them as a market leader in the Gulf region.

CHAPTER 4

- 4.1 : GCC Background
- 4.2 : Brief History of The Industry
- 4.3 : Nature of Telecommunication Service
- 4.4 : Characteristics of Market Demand
- 4.5 : The Issue of Natural Monopoly
in Telecommunications
- 4.6 : Regulatory and Deregulatory Events in
the Industry
- 4.7 : Background to the Process of Liberalization
within GCC Region
- 4.8 : Liberalization: A Competitive Advantage

Analysis of Context: The Telecommunications
Industry in the Arabian Gulf Region.

The Gulf Co-operation Council of the Arab States of the Gulf (GCC) includes the United Arab Emirates, Bahrain, Kingdom of Saudi Arabia, Sultanate of Oman, Qatar and Kuwait.

The (GCC) was first established when leaders of these countries signed the protocol of (GCC) at Abu Dhabi in the UAE on the 25th of May 1981.

Since the majority of the (GCC) states gained their independence from the British Connolly in the late sixties and early seventies, the modern infrastructure in most industriesi was established during the late seventies and early eighties.

4.1: GCC BACKGROUND:

The State Of Bahrain:

The state of Bahrain is located centrally on the southern shores of the Arabian Gulf between latitudes 25, 32 & 26, 20 North and longitudes 50, 20 & 50, 50 East. It lies some 22 km. off the Eastern Coast of Saudi Arabia and slightly further from the Western Coast of the Qatar Peninsula. It is linked with Saudi Arabia by the King Fahad Causeway which was opened in November 1986.

The state comprises a group of about 36 islands with a total land area of about 695.26 square km. The largest of these is Bahrain, where the capital city Manama, is situated. Bahrain island accounts for nearly 85% of the total areas of the state.

The history of conducting population Censuses in Bahrain was initiated in 1941, when the first census was taken. Since then six censuses were conducted in 1950, 1959, 1965, 1971, 1981, and 1992.

Therefore, Bahrain is considered among the most experienced countries in the Arab World and the first in the Gulf Co-operation Council (GCC) in collecting demographic data. Media projections for the state of Bahrain and the (GCC) population and Average Annual Growth Rate (%) (1950 - 2000) has been described in Appendix- E.

Bahrain, whose Per Capita GNP was \$9400 in 1985, was the first country in the Gulf Region to have an oil-based economy in the early 1930's. As the flagship of Bahrain's industrial development programme, the Aluminium Industry continually looked ahead, improving efficiency and increasing output. The total aluminium products was increased from 72.243 in 1980 to 314.900 metric tonnes in 1991. The percentage share of manufacturing in gross domestic product continually increased. It reached 16.5% in 1991 from 10% in 1985, while the percentage share of

crude oil and gas went down from 28.6% in 1985 to 18.6% in 1991.

The State Of Qatar:

The State of Qatar is situated halfway, along the Western coast of the Arabian Gulf. It is a peninsula projecting northwards about 160 km. into the Gulf. At its widest point, the land is about 80 km. between coasts and covers an area of 11437 square km. It has a population of about 380,000. Arabic is the official language although English is widely spoken by Arabs, European and Asian communities who reside and work in Qatar.

Doha where 80% of the population live, is the capital and administrative centre of the country. It lies on the eastern coast and houses the Ministries, Government Departments and Financial Commercial Institutions. The Qatari economy is, to a very large extent, dependent on income derived from the exploitation of oil, natural gas and subsidiary industries. The government encourages diversification in the economy through the setting up of growth projects such as the Steel Complex, and it encourages private enterprise to follow this lead.

The Sultanate of Oman

The Sultanate of Oman occupies the southern corner of the Arabian Peninsula, the main part of its territory lying between the "empty quarter" deserts of Saudi Arabia and the Gulf of Oman and the Arabian sea, with a total area of 312,000 Square km, 451 times the size of Bahrain. (map - Appendix A).

Since the earliest times, Oman's geographical position, has made it an important staging point and entrepot on east-west trading routes. As a result, the coastal-dwelling Omanis have for a long time been seafaring people.

British involvement in Omani affairs began in the mid 19th century and reached its zenith in the early 1930's but this involvement ceased in 1971 when Oman gained its full independence and became, like Bahrain, a member of the Gulf Cooperation Council (GCC) in 1981. Oman has a population of appx. 2 million, growing at the rate of 3.3% annually.

Oman's per capita GNP is much lower than Bahrain's \$6780 in 1985, and the lowest among the rest of the Gulf countries. Economic progress came comparatively late in Oman and the task of development has been complicated by the fact that the country has a smaller oil income, greater indigenous population and a physically larger &

more rugged territory than all its fellow Gulf states. Oman has embarked on an ambitious programme of development with financial assistance from its wealthier neighbours. Like Bahrain, Oman has attempted to diversify its economy from being dependent on oil which represents 83% of its revenue, to include also light industries, like agriculture and fishing.

Kingdom Of Saudi Arabia:

The Kingdom of Saudi Arabia has emerged in this century, and has flourished over the last fifty years of the century. Before 1932, there was no such entity as the Kingdom of Saudi Arabia. Most of the country was wasteland, barren desert where illiteracy and poverty prevailed. An exception to this was the Western part, the Hejaz, where educational and social progress was witnessed as a result of contacts with the Islamic World through the annual confluence of pilgrims coming to Holy Makkah and Holy Medinha.

The history of the Kingdom starts from 1932, the year in which king Abdul Aziz Al Saud united the country under the name "Kingdom of Saudi Arabia". King Abdul Aziz established the Kingdom on the basis of Islamic belief and law - Shari'a system of Government and life and a system of worship as well. The Kingdom of Saudi Arabia is

bounded by the Red Sea to the West, the Arabian Gulf to the East, the borders of Iraq and Jordan to the North and Yemen to the South with an approximate size equating to one-third of the area of the United State of America. Its geography is characterized by desert, a layer of sands over hard rock. At the time of the foundation of the Kingdom, little was known about its agricultural, industrial or natural resources. The people were mostly nomads who travelled in search of water and pasture for their animals. In an environment such as this, it was unrealistic to speak of schools, communications or health.

United Arab Emirates:

The United Arab Emirates is a federation of seven states, formed in 1971. The seven Emirates, Abu Dhabi, Dubai, Sharjah, Ajman, Fujairah, Ras Al Khaimah and Umm Al Quwain are located on the North Eastern tip of the Arabian Gulf, and have a total area of some 80,000 square kilometers. The rulers of the respective Emirates sit on the Supreme Council of Rulers - the Government of the UAE. The seat of the Federal Government is in Abu Dhabi, while the commercial capital of the UAE is undoubtedly Dubai. These two Emirates, which together account for much of the oil wealth, has made it possible to create the UAE into

a modern state from desert in under forty years.

The UAE was a British protectorate from 1820 until independence in 1971, (The UAE celebrated its 20th anniversary in December 1991) and it was during this time that telecommunications first became an aspect of life in the Emirates. In 1959 the Dubai State Telephone Company was formed as a joint venture between the British company IAL (International Aeradio Ltd.) and local partners.

The State Of Kuwait:

The State of Kuwait, covering an approximate area of 17818 square kilometres (6969 sq. Miles), lies between 28 and 30 north of the equator and between 46 and 48 east of the Greenwich Meridian, and is bounded in the east by the Arabian Gulf, in the South & South-West 255 km. by the Kingdom of Saudi Arabia and in the North and West 240 km. by Iraq. The Gulf Coastline is 290 km in length.

The state of Kuwait also includes several islands, the largest of which is uninhabited. Bubiyan as well as Maskan, Warba, Anha, Kubbar, Garu, Umm Al Namil, Akkaz and Umm Al Maradim are some of the islands, Failaka, lying 20 miles out of the Bay, is the only inhabited Kuwaiti island.

The original settlement of Kuwait was founded in about 1710, when a group of tribesmen and their families from Central Arabia were forced by drought to seek new areas

containing pasture and water. They found a good supply of sweet water on the southern shore of what is now Kuwait Bay, and they built a fortress or 'Al Kout'. It is from this that the name 'Al Kuwait' is derived.

4.2: Brief History of the Gulf Region Telecommunication Industry:

The history of the Telecommunications Industry of the Gulf Region is characterized by two main phases. The period before 1970s and the period after 1970s.

Telecommunications in Bahrain:

Bahrain's first telecommunications link to the rest of the world dates back to 1864 when the country was connected to the Indo-European undersea Telegraph cable. This remained the only telecommunications medium until 1931 when Cable & Wireless' predecessors started to operate radio links that provided telegram and telephony services.

During the 1930s, the Electricity Department operated the country's first telephone exchange. The number of staff in 1931 was 15 with two motor cars, one for the manager and the second for calling at the subscribers' premises for installation and repair work. By 1937, there were 39 lines in operation.

The opening of the first public telegraph office in 1974 was followed by the installation of Bahrain's first automatic telephone exchange in 1949. The new exchange had a capacity of 300 lines compared with 130 lines on the old manual exchange.

Until 1934, the company was known as the Imperial and International Communications Company . The telephone services were incorporated into the Wireless Telegraph Company in the early part of 1949. This was being transmitted via Aden or London to all parts of the world.

The company operated from rented premises in the former building of Helal Al Moteryi on Government Road. Following the expansion of its activities, it moved to the old Custom House, with the office subsequently being moved to a new building, known as Mercury House, opposite what was then the Yateem petrol station in Manama.

In 1963 the country's first Telex Services began and in 1969 the Middle East's first Satellite Station was opened at Ras Abu Jarjour. A further Satellite Earth Dish was erected in 1980, and in 1984 a third dish was commissioned with the signing of the Arabsat agreement. In 1979, Bahrain became a partner in the Gulf submarine coaxial-cable linking Bahrain to Qatar and UAE. The first digital telephone exchange was opened in 1980, at Mahuz.

In 1981 the national and international services were brought together. Shortly afterwards, in July 1981, Batelco was formed. Ownership was split between the Bahrain Government, Cable & Wireless and private Bahraini shareholders. At this time, there were 45,627 telephone customers and 1647 telex customers.

Today's Batelco is moving fast towards the digital age. In the summer of 1992, we all saw Bahrain's switching being converted to digital operation and by December 1992, the ISDN (Integrated Services Digital Network) services was introduced.

Batelco's continual investment in the network (the latest expansion is to the Mobile network and a new international switching, together add up an investment of over BD. 11 Million (\$32 Million) has ensured that the services to Bahrain's personal and business users are among the most advanced in any Middle East country. (Batelco Annual Reports, 1992).

Telecommunications in Qatar:

Nearly 50 years ago, the only telecommunications system in Qatar was a primitive magneto-type system operated by Qatar petroleum Company (QPC) in Dukhan. The first system for public use was introduced in the early 1950s. Since then, the network has continually been expanding with new services and facilities being introduced. Today, Qatar has an advanced telecommunications infrastructure that compares favourably with the best anywhere in the world. During the 1970s, Telecommunications in Qatar were operated by two organizations, Qatar National Telephone Service (QNTS), charged with running the telecommunications services within Qatar, and Cable & Wireless, with the international services. In 1973, a Telecommunications Department was set up within the Ministry of Communications & Transport to supervise all technical aspects of national and international civilian telecommunications.

A very significant landmark in the history of telecommunications in Qatar occurred in June 1987, when H.H. Amir of Qatar, issued law no 13, establishing Qatar Public Telecommunications Corporation (Q.TEL) as an independent body with the sole responsibility to develop, operate and maintain telecommunications system within the

State of Qatar and between it and the rest of the world. In accordance with this law, all assets and liabilities of the telecommunications Department, QNTS and Cable & Wireless were vested in Q.TEL and staff from the three former organizations were also transferred to Q. TEL.

The outlook for the future is very encouraging for the telecommunications user in Qatar, as Q.TEL, which operates on a fully commercial basis, continues to invest heavily in new equipment, replacing and upgrading existing line plant, improving both the quality and range of its services.

Q.TEL's telephone exchanges are some of the most modern Stored Processor Controlled (SPC) ones in the world, providing the full range of services demanded by today's telecommunications user. The majority of the exchanges are digital and can handle 90% of customers.

Q.TEL's modernization policy is aiming for 100% digitalization and is about to increase its digital exchanges and upgrade the others for ISDN capability. Further digital exchanges are in the tender stages with the target set for the middle of 1993, to achieve full digitalization (100%).

In striving for better communications, a new state-of-the-art fibre optic network is being planned to connect all exchanges. This will also facilitate the introduction of ISDN in the near future.

The volume and scope of Q.TEL's international telephone services, continue to show strong development. Its services have been expanded and upgraded to meet the continuously increasing subscriber needs, and to provide increased access to international telephone services, with direct dialling now provided to about 175 countries.

All telephone calls within Qatar are at the present free, charges only being made on international calls. There are, at present, a number of specialized call offices which the general public can use to make international calls. However, public phonecards, and payphone services has now been introduced nationwide, which offer both national and international call access. (Q.TEL Articles of Association).

Telecommunications in The Kingdom of Saudi Arabia:

Unification of a vast country like this Kingdom demands the availability of communications to enable the emerging system to govern the various parts of the country. King A. Aziz took the first step on this course by establishing a telegraph network of radio stations in Makkah, Riyadh, Jeddah, Hail, Buraydah, Dawadmi, Tabouk, Qurayyat, Al-Jouf, Abha, Najran and Jazan.

A coincidence of great significance was that the foundation of the Kingdom of Saudi Arabia by King Abdul

Aziz was accompanied by the discovery of oil in the Eastern Region. As the commercial exploitation of the discovered oil proved feasible, the Arabian-American Oil Company (Aramco) was formed to manage the extraction and marketing of this valuable natural resource.

During the period from 1939 (the beginning of the second World War) to 1964, no significant development occurred in the telephone networks, except for the construction of new manual networks in certain cities and the expansion of those already existing, but still there wasn't any inter-city communication. In 1965, the first telecommunications supply and installation contract in the history of Saudi Arabia was signed with the Swedish Ericsson Company for Installation of a "Cross-bar" automatic telephone network to cover 20 cities.

The network was launched in 1968, and was further expanded to a capacity of 12,650 lines serving 23 cities. With the increase of oil revenue in the early seventies, the Kingdom began two five-year planning cycles for the development of the country in the various aspects of life. The telecommunications sector's share in these plans was considerable. In the first plan (1970-1975), two satellite earth stations were built for connection with International networks, opening up true International communications to the Kingdom. The main

regions of the Kingdom were also linked together with coaxial cable and microwave systems extending from Damman in the East to Jeddah in the West and passing across Al-Hasa, Riyadh, Taif and Makkah. The Kingdom's Telex system was introduced in 1974 and direct dialling services were introduced in the Kingdom for the first time in 1975.

During 1975, the Government structure was re-organized. Accordingly, the Ministry of P.T.T. was created to take responsibility of upgrading the telecommunications network to cope with the development and growth forecast in the second five-year plan (1975-1980). That plan formed the backbone of the development and prosperity witnessed in the Kingdom during the eighties. In the period from 1975 to 1980, the solid base for a modern telecommunications network was established, covering the construction of a microwave network with total route length exceeding 10,000 km. This, is in addition to, the installation of more than 600 stations, construction of more than 500,000 telephones services, the upgrading of the telex network with 30,000 lines and introduction of coaxial cable systems and radio stations for maritime communications.

These expansions took shape under a series of planned expansion projects, TEP 1-5 (Telephone Expansion Project) and the SAIL (Saudi Arabian Intra Kingdom Network) 1 and

2 transmission project. A number of expansions have followed the completion of the major works of the TEP projects, with Fiber Optic Loops around the three principle cities being completed, and a number of exchanges being built and the upgrading of contacts. All together, these projects have built a network of over 1.5 Million lines of telephony in the Kingdom over the past 15 years.

(TEP-6) has just been inaugurated. It is set to bring Saudi Arabia's telecommunications into the Digital Age, providing the basis for the highest level of communications system available, locally, nationally and internationally. TEP-6 will see the establishment of high speed, high reliability, Fiber Optic Cable links across the Kingdom, fully digital exchanges capable of handling ISDN (Integrated Services Digital Network) traffic, new satellite earth station facilities, new international digital cable links and the addition of 1 million Extra telephone lines.

TEP-6 will form the basis of the development of telecommunications in Saudi Arabia over the next ten years. It will also serve to ease the current problems faced by the network, including that of the current shortage of new lines for subscribers and the drastic shortage of Mobile telephone lines. Every part of the telecommunications network in Saudi Arabia is set for a change as a result of this programme.

Telecommunications in The Sultanate of Oman:

The history of telecommunications in Oman dates back to 1877 when the first telegraph cable was laid between Muscat (the Capital) and Aden. As in the case of Bahrain, Cable & Wireless was granted an exclusive licence in 1930 to provide international telecommunications services for Oman when their telegraph office was established in Muscat.

However, the first modern network was not inaugurated until the early 1970's. Satellite communications were introduced in 1974 when the country's first earth station was opened, and in 1976 the Government adopted its five-year development plan, the starting point of the telecommunications network development.

In August 1975, Oman telecommunications (OMANTEL) was formed as a joint venture between the Government of Oman and Cable & Wireless with a holding ratio of 60 - 40% respectively and since then Oman's telecommunications have expanded rapidly. In July 1980, the development of the services was stepped up with the establishment of the General Telecommunications Organization (GTO) as a fully owned Government entity under the supervision of the Ministry of PTT. (GTO) continued to develop its telecommunications network within the frame of its 2nd and 3rd five-year plans.

Telecommunications in UAE:

Like the other GCC states, the UAE was a British protectorate from 1820 until independence in 1971, (the UAE celebrated its 20th anniversary in December 1991) and it was during this time that telecommunications first became an aspect of life in the Emirates. In 1959, the Dubai State Telephone Company was formed as a joint venture between the British company IAL (International Aeradio Ltd). and local partners. The first operator of automated telephony services in the UAE (known then as the Trucial State), it was soon joined by operators in other Emirates; the IAL backed Abu Dhabi Telegraph and Telephone Company, the Cable & Wireless backed Sharjah State Telephone Company and Ras Al Khaimah Telephone Authority saw each Emirate gaining an independent operator. Dubai, Ajman and Umm Al Quwain shared Dubai State Telephone Company internal links, and relied upon Cable & Wireless for external communications.

In 1971 the UAE came into being as a federation of former Trucial States. The new nation needed a single body to provide its communications, replacing the small national operators in each Emirate and reflecting the increasing closeness of the member-states of the Federation. This need, led in 1976, to the formation of the Emirates Telecommunications Corporation-Etisalat.

Etisalat inherited five operating companies and an installed base of some 40,000 telephone lines. It integrated the staff and assets of the Dubai, Abu Dhabi, Ajman, Sharjah and Umm Al Quwain operators, with the Ras Al Khaimah Telephone Authority being integrated at a later stage, in 1981. It initially took the shape of a joint venture between Cable & Wireless, IAL and the United Arab Emirates Government, but by 1983 the company was fully nationalized, with a Government shareholding of 60%. 40% of Etisalat's shares are owned by UAE citizens, these are now so popular that they trade at a premium price.

The years since Etisalat's formation, have seen a massive increase in telecommunications capacity and usage. The number of exchange lines has grown from 40,000 in 1976 to a current 428,000 lines, local traffic has minutes in 1976 to a 1990 total of 229 million minutes. Over the past fifteen years, new services such as mobile telephony, data communications, facsimile services and radio paging have been introduced as the technologies have been rolled out. And each new services has been introduced as a commercially viable exercise. Today Etisalat operates an almost entirely digital telephone network, and is gearing up towards the introduction of Integrated Services Digital Network (ISDN). The network

itself would today be unrecognizable to anyone who remembers the small (1976) national network of Strowger, Pentex and Crossbar exchanges.

Comparing the Etisalat network to other international networks, yields some interesting results. The UAE currently has more mobile telephone users than Belgium, more exchange lines per 100 inhabitants than any other Middle East or African country, more public telephones than New Zealand and more telex than the Republic of Ireland and a smaller population than any of these States. In fact, the telephony network is among the world's most technologically advanced, and viewed in the light of the UAE's tiny 1.5 Million population, this is an impressive achievement.

Telecommunications In Kuwait:

Kuwait was a British protectorate from early 1850's until independence in 1962, all the telegraph and telephone links made through Cable & Wireless Company.

After independence, the Government of Kuwait began to move ahead with modern telecommunications networks and to remodel all the old manual exchanges with a high speed, fully electronic exchanges with a larger capacity to match the modernization and the aggrandizing demand of both business and residential users.

Before the Iraqi invasion to Kuwait on August 2nd 1990, there were about 320,000 telephone lines working in Kuwait,

Today the number has abated due to several reasons, the main one being the non-return of the majority of the Arab nationals who had been working in Kuwait for several years, total with other nationals in Kuwait was about 1,200,000 residents.

Kuwait today is considered one of the pioneering countries of the region in the field of communications. In addition to the communication tower embracing extremely sophisticated, high-capacity, electronic operators, there is a lengthy inventory of local telephone services such as: Electronic Directory, Emergency calls system, telex, automatic long-distance calls, radio, pictorial transmission and reception, data bank, naval telephone, all these in addition to the Ground Station located in Um-el-Eish complex, which embraces all ground stations for communications via satellites.

Most of the telecommunications infrastructure was damaged by the Iraqi invasion to Kuwait in August 1990. The Kuwaiti Government is planning to restore all the services within five years with the most advanced technology system that will not only serve the current demand but will be more than sufficient to take Kuwait easily to year 2010, whereby all the high speed, digital, Fiber optic cables and wireless systems will be the primary hardware in the telecommunication systems.

Today as we stand in early 1993, most of the basic services have been restored and the majority of the residents have utilized these services as before that Black 2nd August 1990.

4.3 Nature of Telecommunication Services:

Services provided by telecommunication firms fall into several categories. For local services, subscribers need a telephone connected by wire to a central office. The office contains an exchange for office or home to the exchange, which does not vary with use, and is classified as non-traffic sensitive costs. Other items are classified as traffic sensitive. Long distance services, in addition, require long lines capable of carrying the call over long distances. These may consist of cables, microwaves beamed between towers, or waves sent via satellite.

Long distance revenue is generated by the sale of message toll services (MTS), the regular long distance service, and wide area telephone service (WATS). The latter allows a subscriber to dial anywhere within a given region for a fixed monthly fee. The third type of service is the provision of specialized communications, and it takes the form of private line services. A private line consists of an open line between two fixed points.

Technically, any end of an open line could be connected to a local switching system and connections to all other local systems can also be provided. The more the switching that is provided, the more the service resembles MTS or WATS. The fewer the connections made at the other end, the more the service resembles a private line (Breyer, 1982). Where a telephone firm's revenue shows a relatively larger proportion of private line and WATS, relative to other telephone firms, it is likely to face greater competitive pressures, as businesses are the predominant users of such services, especially for data transmission among their various operating sites.

4.4 Characteristics of Market Demand:

The strongest demand for the various types of telephone services comes from the large, business users. In general, large businesses demand more private line services, compared with smaller-sized businesses whose demand is mainly for standard telephone or telex services. The Gulf region PTTs have reported the same findings in their annual financial reports, that the majority of their revenue comes from the large customers (Major Accounts or Key Customers) due to their huge private systems and the leased Circuits they utilize.

At most, the customers are divided according to their size, revenue, sensitive issues, VIPs, and Government

bodies. These customers form the majority of the business demands and the complicated private network in addition to the specialized services such as Video conferences, ISDN, Group Voice mail, Electronic Mail and large switching systems (PABX).

4.5 The Issue of Natural Monopoly in Telecommunications

Given that appropriate regulation is conditioned by the underlying technological considerations, it may be useful to briefly review the technical arguments, and evidence from the telecommunications industry as to whether natural monopoly exists therein or not. Economics of scale, showing how unit costs for a product changes as the output of that product changes, or economics of scope, showing how unit costs for a product changes as some other product's output changes, are two conditions determining a multiproduct natural monopoly.

A natural monopoly is supposed to exist where the cost function is subadditive. According to Waverman (1989) subadditivity exists where two outputs can be produced at a lower total cost by one firm, rather than by two or more firms. While this is a necessary condition, product specific economies of scale are required to exist to that scale and scope of economies provided that there are sufficient conditions for the existence of natural monopoly.

Waverman (1989) also surveyed the evidence on economies of scale and scope in North American telecommunications. It is a subject which has led to some extremely acrimonious exchanges, given the specific results obtained by different researchers, each of whom used differing methodologies. Twenty studies were reviewed, and of these seven studies examined two and three output cases; these, seven studies shed light on economies of scope between local and toll services provision. Six studies only looked at the one output case and cannot be used to answer scope economy questions.

In general the scope studies report "small economies" (Waverman, 1989: 86); however, two studies are of great interest. In a study for the Justice Department, Evans and Heckman (1983) found significant diseconomies of scope in the operations of the Bell system. Charnes, Cooper and Sueyoshi (1988) used the same AT&T data for the period 1947 to 1977 and instead reported findings of substantial economies of scope. They argued that by using different estimation techniques called goal-constrained programming, they reversed the most important public-policy finding of Evans and Heckman. However, Evans and Heckman showed that Charnes, Cooper and Sueyoshi used a different data set and different models and were thus bound to get different results.

While the evidence on scope economies is controversial, not because there are significant among data sets, levels of aggregation, the functional form and constraints imposed on the data, evidence seems to show that scale economies are generally positive. Nevertheless, in a technologically dynamic industry like telecommunications, it is quite difficult to disentangle technical change and scale economy effects, and if one relaxes neo-classical economic theory assumptions, there may be significant economies or gains of productivity, which may be brought about by changing the nature of organizational incentives through liberalization and deregulation.

4.6 Regulatory and Deregulatory Events in the Industry

Liberalization in telecommunications terms is "The removal of the services provider's monopoly of provision of customer premises equipment".

Since the 1970's there has been a world-wide trend towards liberalization in the telecommunications industry. The supply of equipment, network and services was formerly provided by a state-authorized and generally state-owned monopoly.

The United States was the first country to undertake a major restructuring of telecommunications. Britain was the second with its package of liberalization, regulation

and privatization. Japan, a little more recently, set off along a similar track and many other nations are studying the issue or have already announced limited moves towards liberalization.

Particular pressures have encouraged restructuring in this industry. Technological change, opening up possibilities of new services and improved services has made liberalization particularly desirable & possibly inevitable.

4.7 Background to the process of Liberalization within the GCC Region:

Bahrain: Until the end of 1986, there was not only a complete monopoly in the telecommunications field covering up the network but also the supply of all types of customer premises equipment (CPE) that could be connected to it.

The process was introduced in four stages and therefore it did away with earlier restrictions on the import, purchase and installation of telephone instruments by companies and individuals. The main reason for the gradual introduction, was to give the policy-makers time to obtain evidence before the next decision was actually made.

Stage 1: In January 1987, the first stage of liberalization was approved by Batelco's Board of Directors- resolution No 3/21 - permitting the connection of customer-owned telephone handsets on single, direct telephone lines.

Stage 2: In April 1988, liberalization was extended to cover the supply of all telephone key systems up to six stations (Extensions), answering machines, modems with speed of 24000kbps and call logging equipment.

Stage 3: In January 1989, the Executive Committee (EXCO) resolution 4/56 allowed the connection of privately owned key-systems and PABX's of up to 100 stations only, as well as International Database Access Services (IDAS) terminals.

Stage 4: In December 1989, the Executive Committee approved EXCO Paper No. 4/66 on liberalization of provision of ownership of customer internal premises wiring.

Those items could be purchased from Batelco or from the market i.e. licensed traders, provided the equipment which had official Batelco approval. Competition therefore exists between Batelco and the local traders in the provision of liberalized equipment only. However, this does not include the network. Other radio equipment i.e Mobile telephones, Pagers and cordless phones have not been liberalized. The Ministry of Transport (MOT) has taken on the role of the independent body regulating the process of Liberalization.

Oman: (GTO) operated the telecommunications services in Oman on a monopoly basis until 1986. In July 1986, the

GTO's Board, announced its policy of Liberalization in the field of customer premises' equipment (CPE) and the first item to be liberalized was the PABX's.

Liberalization now covers the following equipments; Telephone instruments, cordless telephones, answering machines, call-barring equipment, PABX's of all sizes, key systems, facsimile machines and automatic telephone-diallers.

Unlike Batlelco, GTO has not been offering such items since then and therefore does not compete with the authorized local traders in the market. Competition exists between these traders only. GTO also acts as the regulatory body for governing liberalization in Oman and therefore type-approves the traders' equipments.

UAE, Saudi, Qatar and Kuwait have the same process of liberalization of (CPE) and have kept the networks under the PTTs control. In Kuwait, Mobile Telephone Systems Co. was formed on June 22nd 1983 by an Amiri Decree with a capital of KD. 25 Million divided into 25 Million shares (49% Subscribed by the Government sector and 51% by the general public.

4.8 Liberalization : A Competitive Advantage:

The business of telecommunications is becoming increasingly customer-led and market-driven after having

been only technology-driven for a long time. The customer is therefore, becoming increasingly the main focus of these companies and the battle for his satisfaction goes on.

As a result, companies keep attempting to develop competitive advantages that will be important to the customer, that will fit within their mission and resources, and that will give them the greatest advantages over competitors, who will find it very hard to match them.

Batelco's Executive Paper to the Board states the objectives of liberalization process in Bahrain as; "to improve service to the customer by promoting competition between providers of customer-premises' equipment".

Porte (1985) argues that the presence of the right competitors can yield a variety of strategic benefits that fall into four general categories: increasing competitive advantage, improving current industry structure, aiding market development and deterring others from entering the market. He says: "the existence of competitors allow a firm to increase its competitive advantage through a number of mechanisms: Absorb demand-fluctuations, Enhance the ability to differentiate, Serve unattractive-segments, Provide a cost umbrella, Improve bargaining-position with labor or regulators, Lower antitrust-risk and Increase motivation."

The promotion of competition is evidently seen as a means for promoting the interest of customers. When competition is feasible, it provides a strong incentive to operate efficiently in order to be able to charge competitive prices and still make a profit, because a firm facing competition cannot take a relaxed view of its levels of cost in the expectation that it can always pump up prices a bit to make sure costs are recovered.

It provides similarly strong incentives to offer a good quality of service and innovative services, taking full advantage of technological change. In a monopolistic industry, the introduction of technological innovation is often sluggish whereas in competition, the incentives for innovation are very strong indeed: a firm does not innovate risks, losing its market to competitors.

As new competitors to BT, Mercury communication utilized the new technology to gain a competitive advantage over BT. by introducing the latest Fiber Optic into their networks giving improved transmission-quality and reliability. Videoconferencing, Voice Mail, Electronic Mail and corporate Data networks with customized applications are increasingly becoming the tools of advantage in an even more harsh competitive environment. However, there still remains some control and regulation within the industry through, for example, equipment-type approvals and rules.

"Regulation is needed to make competition fair, and therefore effective, when some of the competitors continue to have monopoly businesses." (Carsberg, 1986)

" We have a number of competitive advantages. We were state-owned, we were a regulated monopoly. We are no longer state-owned but the monopoly rests, it is regulated, but it is regulated in a way, at least in the U.K., which is quite light ... we own a huge physical network, it is there, and once a customer is attached to it he cannot very easily walk away, and we have a huge customer base." (Lewis, 1989).

In Bahrain and Oman, equipment-type approval and other control measures do still lie in the hands of Batelco and GTO providing them with more advantages in the competitive market.

Bahrain has stepped forward by establishing in January 1993 a Steering Committee on liberalization with the following objectives," To establish the rules and regulations governing the progress of a liberalized telecomms. market and outline the regulatory body functions."

CHAPTER 5

- 5.1 : Research Strategy
- 5.2 : Operationalization of the Research
- 5.3 : Telecommunications Industry Data Sources
and Description
- 5.4 : Sample Profile
- 5.5 : Details of the Data Envelopment Analysis
Models Estimated

Design Of The Research

5.1: Research Strategy:

We adopted a comparative statics strategy for this study. A comment that had been made about extant studies on competitive markets and firm's performance was that they tended to take a static view. A cross-sectional study would enable the identification of several variables impacting on performance; however, in a study of changing market environment like that of the telecommunications industry, several firm-level outcome might be over time because the exogenous variables were changing.

Hence, a comparative static study would help in clarifying ambiguous issues concerning causality. We could view the relationships between changes in the competitive market structure and their impact on firm performance as they were unfolding, and thus reach some conclusions as to the outcome of policy measures undertaken.

While the issue of comparative static testing had not been adequately addressed in much of the empirical literature reviewed, in the telecommunications industry it had been used as a research strategy for the

econometric investigation of the impact of technical changes in Canadian and U.S. firms by Denny, Fuss, Everson and Waverman (1981) and Nadiri and Schankerman (1981) respectively.

5.2: Operationalization of The Research Strategy:

We operationalized the strategy as follows. For each period 1940s till 1970s and 1971 till 1990s, we specified two dependent variables as the model. The first variable was the (PTT's) adoption rate of newer technology, which in the case of telecommunications firms was interpreted as the proportion of electronic to total switches, and how it captured the firms's propensity for innovativeness. The second variable was a vector of measures capturing the performance of individual (PTT's). These measures were estimated using data envelopment analysis (DEA) techniques. We then pooled together the cross-sectional observations of each of the PTTs in the major two-time periods and run regression to explain the variations in the measures of propensity for innovativeness and corporate performance, using as independent variables, market-structure measures and dummies to capture the influences of time on these measures.

The first period (1940s - 1970s) was chosen as the starting point, as there was no telecommunications industry in the Gulf Region as such, and there was no

effective competition in the industry.

The second period proposed in this study was the second half of 1970's till 1990's when the liberalization process began in most of the Gulf States in its lower scale, leading the region to pure competition between the existing PTTs, especially on the International services' fields.

The strategy of calculating a firm-level performance measure using the output of econometric functions and explaining variations in such a measure, had been used in several studies referred to earlier, notably by Banker and Johnston (1989), Page (1980), Pitt and Lee (1981), Shapiro and Muller (1972), and Tyler (1979). Kumar (1990). These researchers had all used frontier production functions, or variants thereof, to derive firm level efficiency scores, and then regressed these against several explanatory variables.

Frontier Production functions, or its Management Science surrogate, and Data Envelopment Analysis, enable the identification of firms who have operated optimal, relative to their own prior performance, or the performance of the firms. Such firms defining the frontier would be x-efficient while the other firms would be x-inefficient (Bruggink, 1982; Carlsson, 1972; Frantz, 1988; Siegfried and Wheeler, 1981; and Timmer, 1971). Given the theory underlying the study, we were thus able

to identify whether x-inefficiency had existed or not in the telecommunications industry, whether they were reducing or even perhaps increasing in the period under study, and what were the factors explaining variations in performance-ranking between PTTs.

5.3: Telecommunications Industry Data Sources Description:

We tested our propositions using local operating companies (PTTs) in the Gulf Region telecommunications industry as the context for our study. There are six telephone companies in the Region, in addition to the Mobile Phone company in Kuwait as a separate entity.

There were several sources of data for the industry. The principal source we used was an Annual Report from the year 1986 till 1992. In addition to financial and firm-level data, other sources of data that we used were the annual International Telegraph and Telephone Consultative Committee (CCITT) issues, and the Communications special supplement to Communications Middle East/Africa.

Other Secondary Data can be categorized into :

Internal: PTT's personal Interviews, PTT's Annual Reports, PTT's Business plan, PTT's other reports, PTT's internal news magazine and finally PTT's memorandum and Articles of Association.

External: Statistical Abstract 1991/1992 GCC States, Arab state telecommunication indicators, International Telecommunication Union (ITU) 1992.

Our primary data collection was through:

- i- An organizational diagnostic questionnaire addressed to 20 Key customers in each GCC State, mainly those who obtained international services from different PTT's either within the same country or within the GCC Region.
- ii- Interviews with the top commercial management of the PTT's in the GCC Region resulted in clear information concerning the liberalization process and the Regional competitor's ability.

5.4 Sample Profile:

The research Sample, which consisted of 120 Key Customers from the Six GCC States selected evenly, was asked to fill in a questionnaire during a personal interview.

The 120 questionnaires, were received in full (100%) response.

5.5: Details of the Data Envelopment Models' Estimates:

We chose not to use standard performance measures such as return on investment because the rate of return regulation in public utilities was such that most firms would have a minimum guaranteed return, and there would

be little variation in performance between firms and over time. We were interested in a measure of performance taking into account the multiple output and inputs a firm produced and used, and how effective it was in resource utilization.

A criticism of neo-classical theory was that profit maximizers principally tended to maximize their allocative efficiency, while not maximizing their technical efficiency (Leibenstein, 1966). The loss of output for consumers so caused was termed producer's surplus, and Harberegger (1954) had shown that such surpluses were low compared to the actual amount of output that could be gained, if a firm operated on the outer bound of its production possibility frontier. In our study, we were interested in a firm's technical efficiency, and not its ability to maximize its allocative efficiency which we held constant, and such an interest was reflected in the way we computed our performance measures.

Our interests were also in comparing the relative performance of a firm over time with reference to its past performance and the performance of other firms. The use of DEA enables both these interests to be fulfilled, and based on the theory underlying our model there would be increasing discretionary effort brought forth by a competitive environment.

CHAPTER 6

- 6.1 : Descriptive Format
- 6.2 : Analysis and Interpretation of Corporate Performance Scores
- 6.3 : The Case of Revenue Maximization
- 6.4 : The Case of Cost Minimization
- 6.5 : Summary of Overall Regression Results

Analysis And Interpretation of Corporate Performance Scores

This part of the study represents the results of the gathered data within the framework of the selected main factors detailed in chapter five. The data analysis is presented in two formats; first, we will look at the overview and layout of the results (descriptive Format). This is done by presenting the number and percentages of the responses to each variable in tables, then the percentages are interpreted and linked to the related literature, and the results of the tariffs' comparison; and the second part is of the information collected, and will deal with different figures showing the infrastructure of the GCC States telecommunications Industry.

Second, we will tackle the Interpretation performance-scores using the case of Revenue maximization and cost minimizations

6.1: Descriptive Format:

120 Interviews were conducted with 20 Key Customer Managers, in each (GCC) State evenly which represent a (100%) response to our sample size selected for this particular study.

Table 1 shows, that the majority (95%) of the interviewed individuals were in the age group of

(26 - 35) and the remaining (05%) were in the age group of (36 - 45). During my interviews, I noticed that the majority of Telecommunication Managers, Officers, and Supervisors were Engineers or mostly having an Engineering back-ground. In order to be effective decision makers, Technical background is essential for such high positions.

Table -1: Participants' Age-Groups.

Value	Frequency	Percentage
Less Than 18	0	0.0
18 - 25	0	0.0
26 - 35	114	95.0
36 - 45	06	05.0
Over 46	0	0.0
Total	120	100.00

Table 2 shows the type of services utilized by the selected Key customers in the GCC States. 70% of their were using Leased Circuits (Data), 14% were using Leased Circuits (Voice), 8% were using Pocket Switching and the remaining 8% used Message Switching Services.

In fact no 'Video Conference Service' were used by the 120 Key customers, and the main reason for this was that the service was not welcomed in the Gulf Region as the amount of telecommunications media is very high and so these is possibly no need for such services.

Table -2: Type of Services Used.

Value	Frequency	Percentage
L.C. (Data)	84	70.0
L.C. (Voice)	18	14.0
P.Switching	09	08.0
M.Switching	09	08.0
V.Conference	0	00.0
Total	120	100.00

Table 3 indicates the different speeds used by the 84 customers (Ref. to table 2) for their Leased Circuits (Data). Of these, 12.5% were using Telegraph, 25% used (≤ 9.6 Kbps), 58% used (≥ 9.6 Kbps) and the remaining 4% were using higher speeds such as 128 Kbps.

Table -3: Speed Specifications (LC.Data)

Value	Frequency	Percentage
L.C. (Data)	60	70.0
L.C. (Voice)	12	14.0
P.Switching	06	08.0
M.Switching	06	08.0
V.Conference	0	00.0
Total	84	100.00

Table 4 indicates that arrange the 18 key customers (Ref. to table 2) Leased Circuits (Voice) type, 33% were using Ring down, and the majority 67% were using Shout-Down type.

Table -4: Leased Circuits (Voice) type.

Value	Frequency	Percentage
Ring Down	06	33.0
Shout Down	12	67.0
Total	18	100.00

Table 5 shows the level of satisfaction for each of the Key Customers interviewed regarding his telecommunications provider (PTT). 44 customers were found to be extremely satisfied with services provided by their carriers, 66 customers were satisfied, 5 customers were neutral, 5 customers were unsatisfied, mainly with, Message Switching Services, and finally there were no customers indicating extremely unsatisfied.

Table 5: Level of Satisfaction.

TYPE OF SERVICES	(1)	(2)	(3)	(4)	(5)	TOTAL
LC DATA	21	45	05	00	00	71
LC VOICE	13	08	00	00	00	21
P.SWITCHING	05	05	00	00	00	10
M.SWIRCHING	05	08	00	05	00	18
V.CONFERENCE	00	00	00	00	00	00
TOTAL	44	66	05	05	00	120

(1): Extremely Satisfied. (2): Satisfied.
 (3): Neutral. (4): unsatisfied.
 (5): Extremely Unsatisfied.

Table 6 presents the main reasons for the five unsatisfied customers with the Message Switching service. (Refer to tables 5). The main reason for their dissatisfaction was the quality of services provided by their carrier (PTT).

Table 6: Reasons for Dissatisfaction .

TYPE OF SERVICES	(1)	(2)	(3)	(4)	(5)	TOTAL
LC DATA	00	00	00	00	00	00
LC VOICE	00	00	00	00	00	00
P.SWITCHING	00	00	00	00	00	00
M.SWIRCHING	00	00	05	00	00	05
V.CONFERENCE	00	00	00	00	00	00
TOTAL	00	00	05	00	00	05

- (1): Provision of Service.
- (2): Speed Availability.
- (3): Quality Of Services.
- (4): Tariffs (cost).
- (5): After-Sales Services.

Table 7 shows the customer's choice for the unsatisfied services (5 Customers). In case it is provided at a better quality, by other carriers by other carrier in the Gulf Region, and thus will overcome their existing problems, then 100% expressed willing pen to change their carrier.

Table 7: Willingness to change the (PTT).

Feedback	Frequency	Percentage
YES	05	100
NO	00	000
DON'T KNOW	00	000
TOTAL	05	100

Table 8 provides us with a clearer picture concerning the 5 unsatisfied customers and their willingness to change their carriers to overcome their existing problems; even if the cost is higher, they have no objection to sacrificing towards better services; whereas the 5 customers represent (100%), agreement to shift to higher tariffs.

Table 8: Willingness to Pay Higher Tariffs.

Feedback	Frequency	Percentage
YES	05	100
NO	00	000
DON'T KNOW	00	000
TOTAL	05	100

Table 9 shows the 5 unsatisfied customers' response towards gaining a competitive edge among other competitors by using costly services of new carriers for better quality of services. The positive response in this case were (80%) and the remaining (20%) didn't know. During the interviews, as Zakumund (1991) had indicated, one of the personal-interview advantages that diversion question might be asked, "since the interviewer is in a face-to-face position with the interviewee, it will undoubtedly lead to accurate findings."

Table 9: Feeling for Competitive Edge.

Feedback	Frequency	Percentage
YES	04	80.0
NO	00	00.0
DON'T KNOW	01	20.00
TOTAL	05	100

Table 10 indicates the level awareness of the existing competitive forces between major carriers (PTTs) in the Gulf Region. Were 41 customer have reported that they were extremely aware of the competitions between the (PTTs) within the Gulf Region, 62 customers were aware, and 17 customers were neutral in their opinions, as they were not sure of the full details of such competitions from one side and they were not sure about tariff-issues, whether they would obtain lower costs, if they selected different carriers from their base locations through leased circuits with one of the GCC (PTTs) to cut cost and they would have superior quality of services.

Table 10: Competition Level of Awareness.

TYPE OF SERVICES	(1)	(2)	(3)	(4)	(5)	TOTAL
LC DATA	10	09	05	00	00	24
LC VOICE	08	08	04	00	00	20
P.SWITCHING	10	15	02	00	00	27
M.SWICHING	09	12	03	00	00	24
V.CONFERENCE	04	18	03	00	00	25
TOTAL	41	62	17	00	00	120

(1): Extremely Satisfied. (2): Satisfied.
 (3): Neutral. (4): unsatisfied.
 (5): Extremely Unsatisfied.

Table 11 indicates one of the most important variables, the customer perception of the (PTTs) status, in the Gulf Region. The different criteria received a different scoring by the interviewed key customers, which reflected the different levels of awareness. Batelco scored 40% of the overall standard criteria, Etisalat scored 31% of the overall score, Q.Tel had a 14% score and finally Saudi PTTs scored 15%. There was no score for GTO and Kuwait (PTT's).

Table 11: PTTs Standard.

TYPE OF SERVICES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	TOTAL
BATELCO	06	05	05	07	07	05	05	40
ETISALAT	04	05	04	05	04	06	03	31
Q.TEL	01	02	01	02	02	02	04	14
SAUDI PTT	02	03	01	02	02	04	01	15
TOTAL	13	15	11	16	15	17	13	100

(1): Availability of Service. (2): Quality of Services.
 (3): Carrier Diversity. (4): Cost (Tariffs).
 (5): Familiarity/Continuity. (6): Size of Network.
 (7): Image of Carrier.

Table 12 showing the involvement level of the (PTTs) in the Gulf Region with the Interviewed Key Customers' Strategic Plan on, Business Plan 71% oftren reported that may were involved in such planning acting while others (29%) were not.

Table - 12: Carriers Involvement with Key Customers Strategic Plan.

Value	Frequency	Percentage
Yes	85	71.0
No	35	29.0
Total	18	100.00

Table 13 shows that of the 85 agreed customers (Ref. to table 12), whose (PTTs) were discussing their future and business plans, 90% of them reported that their carriers not taken the initiative to tailor their Marketing Strategy with the Customers Strategy.

The remaining 10% agreed positively that their carriers worked out suggestions and proposals to meet their current and future requirements. One of the reasons why GCC carriers did not develop proposals, were the lack of global views, the absence of Pro-active Marketing Strategy sections and the necessary skills needed to carry out such important levels of decisions and efficient solutions to the key customers' problems.

Also it is worth mentioning that even PTTs from overseas such as C&W and Mercury (UK) have approached few Key customers to develop their strategic plan according to their needs and future status.

Table - 13: Carriers' Feedback with Key Customers' Strategic Plan.

Value	Frequency	Percentage
Yes	09	10.0
No	76	90.0
Total	85	100.00

Table 14 shows the Quality of Services factors and the importance sequence in the view of the interviewed 120 key customers. 60% of the highest score (ranking 1) were obtained by the Circuit availability, and the second, ranking 11%, for the Tariffs or the billing charges of the circuits. Under certain circumstances, customers have no choice but to go ahead and obtain the available circuits at a lower quality, especially if they need it for local markets.

Another spotted indication during my interviews was that customers were confused by the massive technology changes which forced them to change their systems accordingly.

Table 14: Quality Of Services Importance.

Quality Of Service Variables	Importance
Circuit Availability	60.00
Circuit Provisioning	04.00
Fault Management	06.00
Provisioning Management	05.00
Quality of Staff	03.00
Transmission Media	04.00
Billing	11.00
Transmission Performance	07.00
Total	100.00

6.1.1: Tariffs Comparison:

As part of my interviews with the key customers, I conducted several meetings with the (PTTs) Commercial and Engineering staff in order to obtain information for our comparisons.

Since International Telecommunications is the only field where competition can be measured easily and more effectively, our comparison will be based on the internationally leased circuits within the GCC countries and to the business centres worldwide.

Table 15 presents Batelco's monthly charges for 64 kbps Leased Circuits, to GCC states and other Business Centres.

Table 15: Batelco Tariffs for 64 Kbps to GCC.

Quantity	Variable	1 Y.Cont.	3 Y. Cont	5 Y.Cont.
1 Circuit	A BD 393 B BD 3947	A BD 373 B BD 3750	A BD 349 B BD 3509	A BD 327 B BD 3290
2 Circuit	A BD 354 B BD 3552	A BD 336 B BD 3375	A BD 314 B BD 3158	A BD 294 B BD 2961
3 Circuit	A BD 334 B BD 3355	A BD 317 B BD 3188	A BD 297 B BD 2983	A BD 278 B BD 2797
4 Circuit	A BD 314 B BD 3158	A BD 298 B BD 3000	A BD 279 B BD 2807	A BD 262 B BD 2632

A) GCC States. B) Business Centres.
C) Variable Term : Less than one Year.

GCC Countries charges to Bahrain and Business Centres:

UAE Monthly charges to Bahrain	= BD 485
UAE Monthly charges to Business Centres	= BD 3165
Kuwait Monthly Charges to Bahrain	= BD 1306
Kuwait Monthly Charges to Business Centres	= BD 3918
Other GCC States (Oman, Saudi Arabia, Qatar) do not provide the 64 Kbps speed.	

It's worth to mentioning how the leased circuit charges are calculated. The above tariffs are only 50% of the charges i.e if a Bahrain-based key customer would like to have leased circuits from Bahrain to Dubai, he will apply for this service. If he

selects one-year contract, it will cost him (BD 373.000) for Bahrain and in addition to Dubai, charges will be (BD 485.000). This basically means a monthly billing of (BD 858.000).

Table 16 presents Batelco charges for 9.6 Kbps Leased Circuits to other GCC countries and Business Centres.

Table 16: Batelco Charges for 9.6kbps.
(IN BD PER CIRCUIT):

	VARIABLE TERM	1 YEAR CONTRACT	3 YEARS CONTRACT	5 YEARS CONTRACT
1 CIRCUIT	A 272.000 B 1835.000	A 258.000 B 1743.000	A 240.000 B 1632.000	A 224.000 B1529.000
2 CIRCUITS OF SAME SPEED	A 245.000 B 1652.000	A 232.000 B 1569.000	A 216.000 B 1469.000	A 202.000 B1376.000
3 CIRCUITS OF SAME SPEED	A 231.000 B 1560.000	A 219.000 B 1482.000	A 204.000 B 1387.000	A 190.000 B1300.000
4 CIRCUITS OF SAME SPEED	A 218.000 B 1468.000	A 206.000 B 1394.000	A 192.000 B 1306.000	A 179.000 B1223.000

UAE MONTHLY CHARGES TO BAHRAIN	= BD 290
UAE MONTHLY CHARGES TO BUSINESS CENTRES	= BD 1905
KUWAIT MONTHLY CHARGES TO BAHRAIN (KD 800)	= BD 1045
KUWAIT MONTHLY CHARGES TO BUSINESS CENTRES	= BD 2154
OMAN MONTHLY CHARGES TO BAHRAIN	= BD 400
OMAN MONTHLY CHARGES TO BUSINESS CENTRES	= BD 2000
SAUDI MONTHLY CHARGES TO BAHRAIN	= BD 1050
SAUDI MONTHLY CHARGES TO BUSINESS CENTRES	= BD 2000
QATAR MONTHLY CHARGES TO BAHRAIN	= BD 860
QATAR MONTHLY CHARGES TO BUSINESS CENTRES	= BD 3000

Table 17 presents Batelco charges to GCC states and other Business Centres.

Table 17: Batelco Charges for 50 Baud.
(IN BD PER CIRCUIT):

	VARIABLE TERM	1 YEAR CONTRACT	3 YEARS CONTRACT	5 YEARS CONTRACT
1 CIRCUIT	A 68.000 B 594.000	A 65.000 B 564.000	A 60.000 B 528.000	A 56.000 B 495.000
2 CIRCUITS OF SAME SPEED	A 61.000 B 535.000	A 59.000 B 508.000	A 54.000 B 475.000	A 50.000 B 446.000
3 CIRCUITS OF SAME SPEED	A 58.000 B 505.000	A 55.000 B 479.000	A 51.000 B 449.000	A 48.000 B 421.000
4 CIRCUITS OF SAME SPEED	A 54.000 B 475.000	A 52.000 B 451.000	A 48.000 B 422.000	A 45.000 B 396.000

UAE MONTHLY CHARGES TO BAHRAIN = BD 72
 UAE MONTHLY CHARGES TO BUSINESS CENTRES = BD 477

KUWAIT MONTHLY CHARGES TO BAHRAIN = BD 352
 KUWAIT MONTHLY CHARGES TO BUSINESS CENTRES = BD 666

QATAR MONTHLY CHARGES TO BAHRAIN = BD 108
 QATAR MONTHLY CHARGES TO BUSINESS CENTRES = BD 750

SAUDI MONTHLY CHARGES TO BAHRAIN = BD 345
 SAUDI MONTHLY CHARGES TO BUSINESS CENTRES = BD 900

ONLY OMAN DOES NOT PROVIDE THE ABOVE SPEED.

Comparison Summary:

After reviewing and comparing Batelco's existing International leased circuits charges for speeds 64 KBPS , 9.6 KBPS and 50 Baud with other administrations, the GCC states in particular, we can

clearly see that Batelco's existing tariffs for the above speeds are cheaper by a significant percentage as it is stated below:

1 - 64 KBPS:

Bahrain's existing tariff for the above speed is :

- 32% cheaper than UAE.
- 232% cheaper than Kuwait (Kuwait's charge is approx. 3 times higher than Bahrain).
- Other GCC states do not provide this speed.

2 - 9.6 KBPS:

Bahrain's existing tariff for the above speed is :

- 7% cheaper than UAE.
- 284% cheaper than Kuwait (Kuwait's charge is approx. 4 times higher than Bahrain).
- 47% cheaper than Oman.
- 286% cheaper than Saudi (Saudi's charge is approx. 4 times higher than Bahrain).
- 216% cheaper than Qatar (Qatar's charge is approx. 3 times higher than Bahrain).

3 - 50 BAUD

Bahrain's existing tariff for the above speed is :

- 6% cheaper than UAE.
- 317% cheaper than Kuwait (Kuwait's charge is approx. 5 times higher than Bahrain).
- 59% cheaper than Qatar.

- 407% cheaper than Saudi (Saudi's charge is approx. 5 times higher than Bahrain).
- Oman does not provide this speed.

On the whole, Bahrain's existing tariffs are cheaper than GCC states and most of the Business centres. Furthermore, Batelco applies different discount schemes i.e. Multi Discount and Term Contract discount.

6.1.2 Corporate Performance Comparison:

Table 18 and 19 display how the actual scores changed from period to period for the GCC telecommunication industry as a whole, for the years (1987 - 1991).

Table 18: Comparison of Relative Percentage Changes in Corporate Performance.
Measure 1 (Rev.MAX) Across GSS PTTs

PTT's	1991	1990	1989	1988	1987
Bateclo	.14	.11	.09	.04	.03
Etisalat	.22	.18	.15	.14	.11
Q.Tel.	.26	.20	.18	.15	.13
Saudi PTT	.18	.16	.13	.09	.08
GTO (Oman)	.09	.07	.04	.04	.02
Kuwait	.02	.07	.14	.12	.10
Industry Avg	.15	.13	.12	.10	.08

Table 19: Comparison of Relative Percentage Changes in Corporate Performance.
Measure 2 (Cost.Min) Across GSS PTTs

PTT's	1991	1990	1989	1988	1987
Bateclo	.17	.12	.09	.04	.08
Etisalat	.20	.22	.03	.14	.04
Q.Tel.	.15	.24	.11	.05	.12
Saudi PTT	.21	.09	.14	.06	.11
GTO (Oman)	.14	.12	.04	.03	.07
Kuwait	.12	.11	.05	.07	.11
Industry Avg	.16	.15	.08	.06	.09

6.1.3: International Telecommunication Union (ITU):

The first issue of the (ITU) report October, 1992 focused on Arab States Telecommunication Indicators for the year 1991. (Figures are accompanied at the end of this chapter).

This document was prepared for the Regional Telecommunication Development Conference for Arab States held in Cairo, Egypt from 25 to 29 October 1992. These indicators are based on a special questionnaire sent to Arab countries as well as to (ITU) in-house data file. The purpose of this document was to provide a comprehensive and comparable set of telecommunication indicators comprising the latest available data for the Arab States.

For the sake of comparison between the GCC countries only, we will focus on the GCC Region Telecommunications Industry and their carriers.

Figure 1 shows the basic indicators for population and population density. The data for population are mid-year estimates from the United Nations (UN). Population density is based on land area data taken from (ITU) data files; the land area does not include any overseas dependencies.

One important indicator shows the large Saudi Arabian total population compared with the other GCC States, which represents more room for expansion in the future of the Telecommunication business.

Figure 2 shows the basic indicators for (GDP) as per capita statistics. The data for Gross Domestic Product (GDP) are from the IMF and the (UN). They are current-price data in national currency converted to United States Dollars.

Again, Saudi Arabia total (GDP) is the highest among GCC countries and UAE is the second.

Figure 3 shows the basic indicators for the Main Lines total per 100 inhabitants, where the Main Lines refer to telephone lines connecting customer equipment to the (PSTN) and which have a dedicated port on a telephone exchange. Main Lines per 100 inhabitants are calculated by dividing the number of the main lines by the population and multiplying the quotient by 100.

The total numbers of lines in Saudi Arabia are the largest among the GCC countries, followed by UAE.

Figure 4 shows the number of employees per 1000 lines. Main Lines per 1000 employees are computed by dividing the number of main lines by the number of employees.

The lowest rates were that of Batelco, 47.40, which means that 47.40 employees can serve 1000 lines, so the efficiency level is high, compared with the highest employee record in UAE, where 106.21 employees serve 1000 lines.

Figure 5 shows the revenue (turnover) received and

costs associated with providing telecommunication services in the country. United States dollar-values data may not be strictly comparable due to a number of factors, First, it is assumed that the data relates to revenues and costs of all PTOs providing services in the country. This is not unequivocally known and may be impossible to determine since there may be no legal requirements for all operators to provide financial information or, the operator may be part of parent companies that only provide consolidated accounts. Second, the operators may have subsidiaries with financial activities, unrelated to telecommunication services, which may be included. Third, in the case of countries where posts and telecommunications are combined, a perfect allocation of revenues and costs is not always possible. Fourth, there are definition and accounting differences among GCC States countries.

Revenue consists of all telecommunication revenues earned during the year under review. Expenses include operational costs for salaries, material, maintenance and repair, depreciations charges made for the loss of value of equipment, interest paid on loans, and other costs which

cannot be assigned to operations. The Saudi Arabia (PTTs) is the highest in net profit.

Figure 6 shows the contributions divided by the net-profit made. This figure shows how many employees made a certain amount of profit. Saudi Arabia is the best as every 100 employees can make 5.74% profit, followed by UAE which is 5.33%.

Figure 7 shows the capacity which refers to the total number of main lines that can be connected to local public switching exchanges. The numberd used lines is obtained by dividing the number of main lines on service by the total capacity. The highest capacity is available in Saudi Arabia where 1,614,000 lines were used on only 1,242,000.

Figure 8 Shows the total number of applicants for a connection to a main line which have had to be on-hold/ held back owing to a lack of technical availability. It should be noted that the wait-list refers to applications which have been received and does not include those who desire a telephone line but have not submitted an application. Bahrain and UAE having only 0.04% on the waiting-list which shows high proficiency.

Figure 9 shows the full-time staff employed by telecommunication enterprises providing public telecommunication services. Saudi Arabia (PTT) has the highest number of staff 20403.

Figure 10 shows the actual number of main lines per 100 inhabitants in 1991 and the estimated number in 2000 based on current growth rates and forecasted population.

6.2 : Analysis and Interpretation of Corporate Performance Scores:

Emory (1985) emphasized that several research purposes can be served by associating statistical data. First, one can determine if there is any relation between two or more sets. The second research served by the analysis of association is that of predication. The third value-association analysis is that which can sometimes statistically control the influence of certain variables in order to study the impact of other variables.

We discussed in Chapter Five our use of DEA to calculate the performance scores of Telecommunication firms over time. We had specified two such measures of performance. One was a measure capturing each firm's ability to attain maximum revenues, given its base of assets; the other was a measure capturing the ability of a firm to reduce costs, given the output it was producing. The results of these computations are laid out as follows:

In (Figures 5 & Table 18, 19) we displayed graphically and statistically how the DEA-generated corporate-performance scores, changed from period to period; we measured this change as a relative percentage

amount, and this enabled us to assess the rate and direction of movements in measures of corporate performance. The percentage changes are reported with reference to the industry as a whole, and also with reference to each of the six operating (PTT's) which we used to classify as all the individual operating (PTT's) observations. In the last section of this chapter, we carry out a detailed discussion, with reference to the particular circumstances of each of these six operating (PTT's), as to the possible reasons for the rate and direction of movements in their performance scores.

To arrive at a composite, percent-change figure for each of these operating (PTT's), we first calculate an overall corporate performance measure score for the group, for each of the two measures. Thereafter, we computed the relative percent change in each measure for the group over the different time periods.

6.3: The Case of Revenue Maximization:

A clear indication that over time (PTT's) have become better performers with respect to maximizing revenue to their assets' base is shown graphically in Figure 5 and statistically in table 18.

Between 1978 to 1991 all the six (PTT's) within the Gulf Region, improved their revenue maximization scores relative to their own past scores.

Between the period 1990-1991 all the Gulf (PTT's) except Kuwait (PTT's) managed to show an increase ranging from 1% to 3%, which is not surprising, given the fact that the Gulf Crisis followed by the Gulf War brought tremendous traffic and Leased Circuits between the GCC States from one side and joined United Nation Forces based in the Gulf with their Head Quarters worldwide.

Since changes in the industry were on the horizon in 1981, it can be argued that in anticipation PTT's will alter their internal dynamics to be more market-responsive, especially after the partial liberalization process in some of the GCC States. Hence we could expect large changes in the revenue maximization score in the first half of 1990s.

A glance at the figures depicting each (PTT's) performance shows that during this period (1988 - 1991), (PTT's) rate of change in their revenue maximization scores ranged from 1% to 3%.

Figure 5 shows that 1991 net profit for most of the (PTT's) performance had improved, as reflected by the percentage changes in the revenue maximization scores.

Such results substantiated some of our theoretical arguments, wherein we suggested, that in a process of dynamic industry transition, employees would be motivated to seek long-term rents from their jobs and increase their levels of discretionary efforts. Given the behavioural assumption underlying our framework, the effects of such

increase would be to increase revenues, since sales productivity would ensure the creation of "rents" by an employee. Hence, as the competitive environment changed from a placid state to a dynamic one, we would expect overall levels of revenue maximization in a firm to increase. This was reflected in the general trend of scores for the period 1988 - 1991 and the results validate some of the underlying assumptions of our theoretical framework.

The above observation are also borne out on a general basis when we review the average percentage change in these scores for the industry sample as a whole. The overall increase between 1988 to 1991 was an average of 3%. This was primarily made up of 2.5% improvements during 1990 - 1991 and these were period when a competitive environment internally with local traders, and regional with the other GCC (PTT's) had been established.

6.4: The Case of Cost-Minimization:

As in the case of revenue maximization scores, Table 19 shows that in the period of 1988 to 1991 for most of the operating (PTT's), their relative cost minimization scores improved, apart from Saudi Arabia and Kuwait which can be related to the massive expansion and high market demand in the Saudi market, and the re-building of the telecommunication infrastructure after the enormous damages by the Iraqi invasion (August 1990).

As was the case with the revenue maximization scores, several distinct periods of time were important in contributing to overall changes in the cost minimization scores over the period of 1988 to 1989. In the period of 1988 to 1991, there was a considerable positive change in the scores for all groups concerned. This ranged from 1.4% to 3.8%.

Another time-period, when appreciable positive changes in the cost-minimization scores took place, was the 1990 to 1991 period, when liberalization started more effectively and there was regional competition in the field of international services such as Leased Circuits, and Message Switching. The positive changes in the scores of almost all the other (PTT's) may be reflective of the fact that they had tightened their operating efficiency routines, so as to be competitive in an increasingly deregulated world.

The above results also had implications on our theoretical framework. We had posited that the onset of a competitive environment would evoke both an increase in discretionary effort, and the reduction of inertia. The former would manifest itself primarily in revenue generating activities, while the latter would find expression in cost saving behaviour. We assumed a linear relationship between environmental changes and behavioural outcomes. However, the fluctuations of the cost minimization scores made us rethink about this functional relationship.

We saw from the evidence generated, that in the early phases of the transition of a regulated environment to a competitive one, both revenue-maximization and cost-minimization scores increased. However, as such changes continued, cost-minimization scores changed negatively, only changing positively when actual competition manifested itself in the industry. Hence, there were substantial non-linearities which described the nature of the relationship between a competitive environment and cost-minimization

Inductively it seemed that actual competition, such as that stated recently, in the Gulf region between the (PTT's) as main carriers for the telecommunication industry, prompted cost minimization scores to improve. However, the more promising of opportunities available from a competitive environment seemed to evoke revenue maximizing behaviour. At the inter-firm level these observations could imply that in the transition to competition, employees would prefer revenue maximization activities over those of cost minimization, as these were intrinsically more challenging and useful for gaining organizational visibility.

Hence, in the early phases of such transition there would be sacrifices or declines in operating efficiency. As competition increased, the need then to keep their

jobs would motivate employees to reduce their inertia and minimize costs. However, over time, the environment would provide incentives to be simultaneously enterprising and efficient, and this would reflect itself in an increase in both revenue maximization and cost minimization scores.

6.5 : General Summing Up:

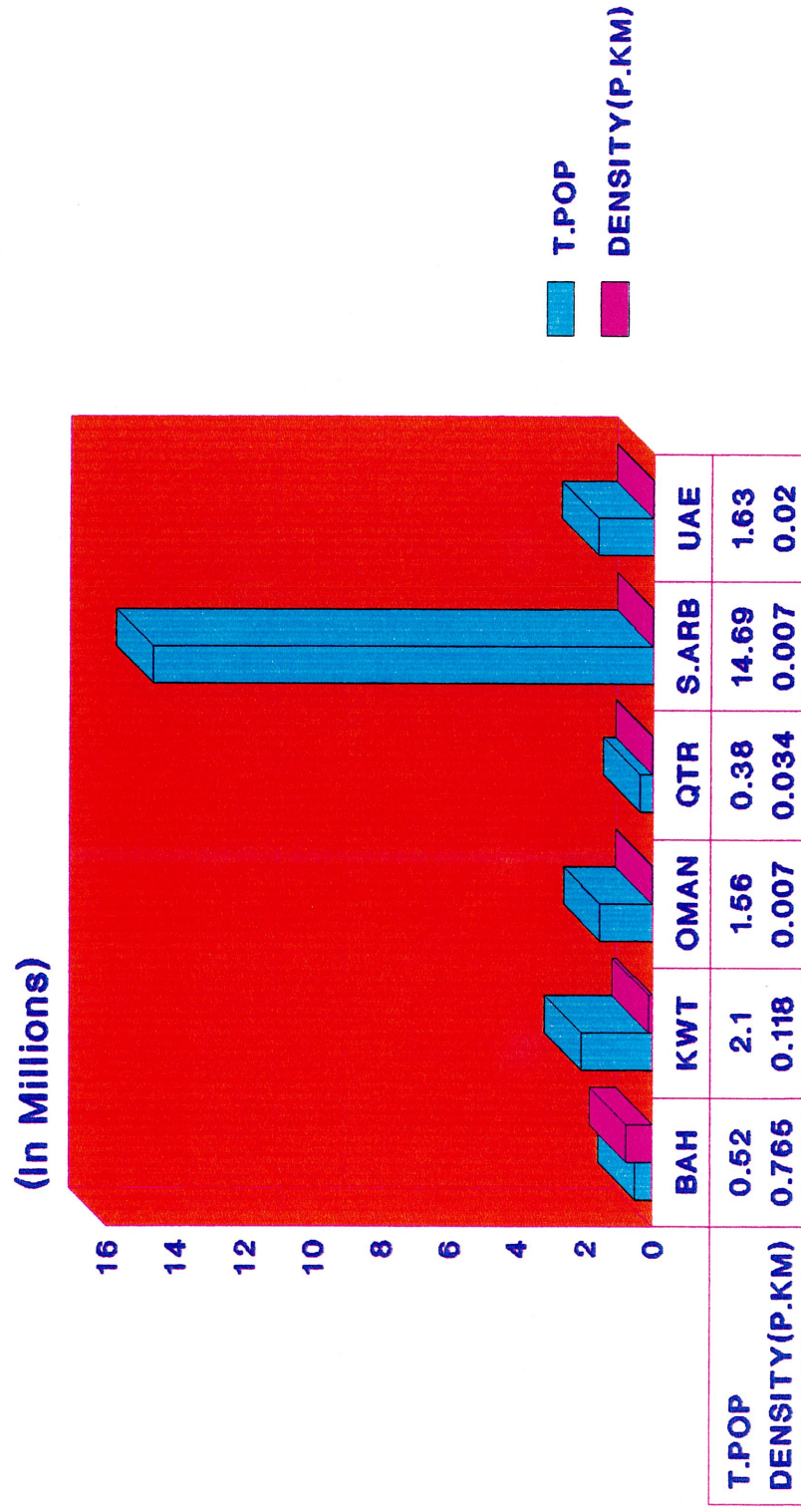
In the past sections we have discussed in detail the factors specific to the GCC (PTT's) that might account for the pattern of changes in their performance scores. For mostly all of them, operating in the cost-minimization scores were greater than that of changes in the revenue-maximization scores.

A feasible general explanation for such results may be as follows. As the environment became more open for companies to exploit opportunities therein, they sought both economic and political ways to exploit these with a consequent improvement in their revenue maximization scores. This would have diverted attention away from functional operating areas normally a traditionally public utility focus, with a consequently lower rate of positive changes in the cost minimization scores. Hence consistent increase in revenue maximization scores and considerable positive and negative fluctuations in cost minimization score were a general indication that ongoing cultural changes within the firms were occurring, as a result of changes in their competitive environment, and this was also revealed by some of the firm specific analysis.

BASIC INDICATORS (1991)

GCC COUNTRIES

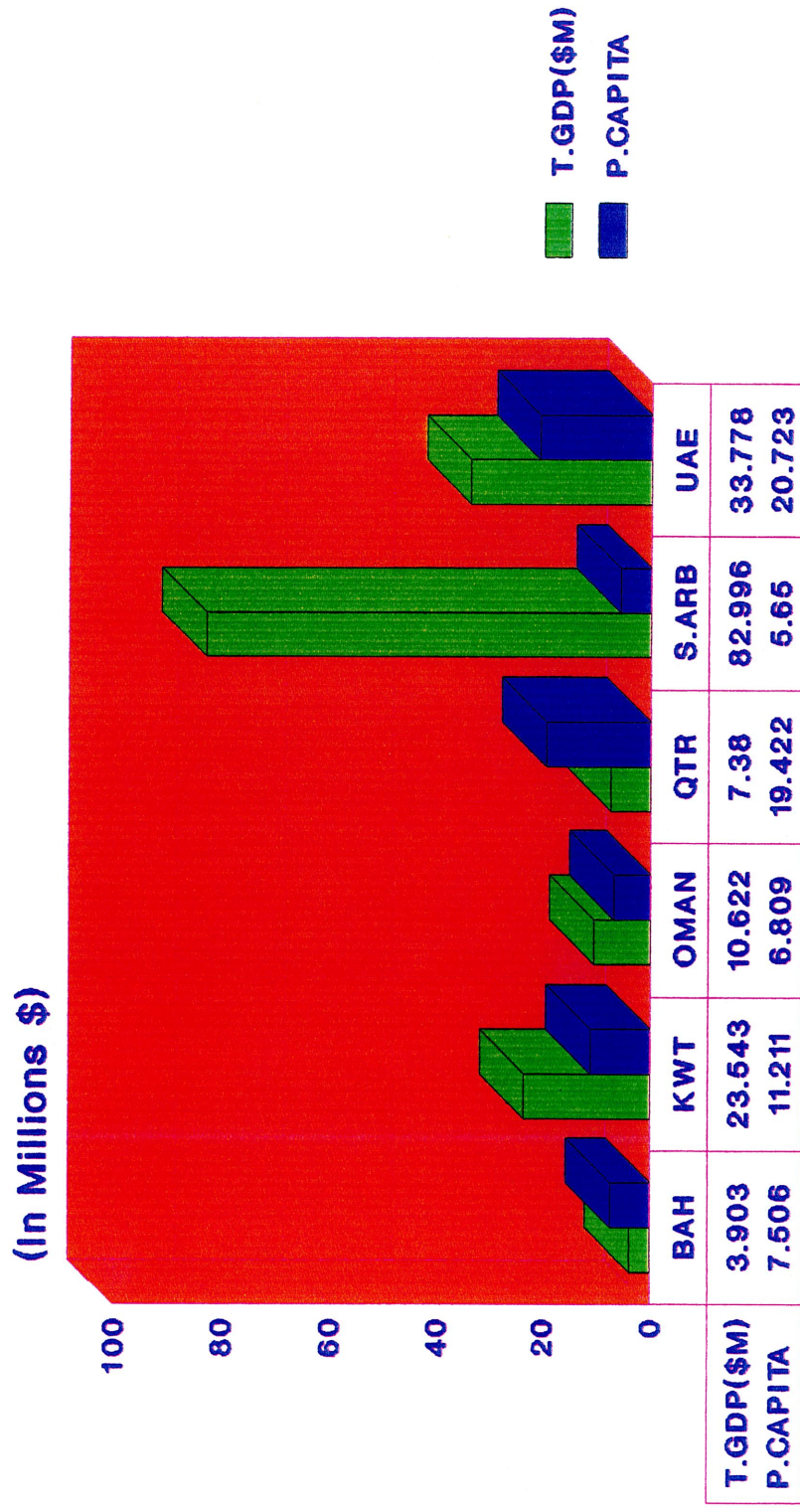
(FIGURE- 1)



BASIC INDICATORS (1991)

GCC COUNTRIES

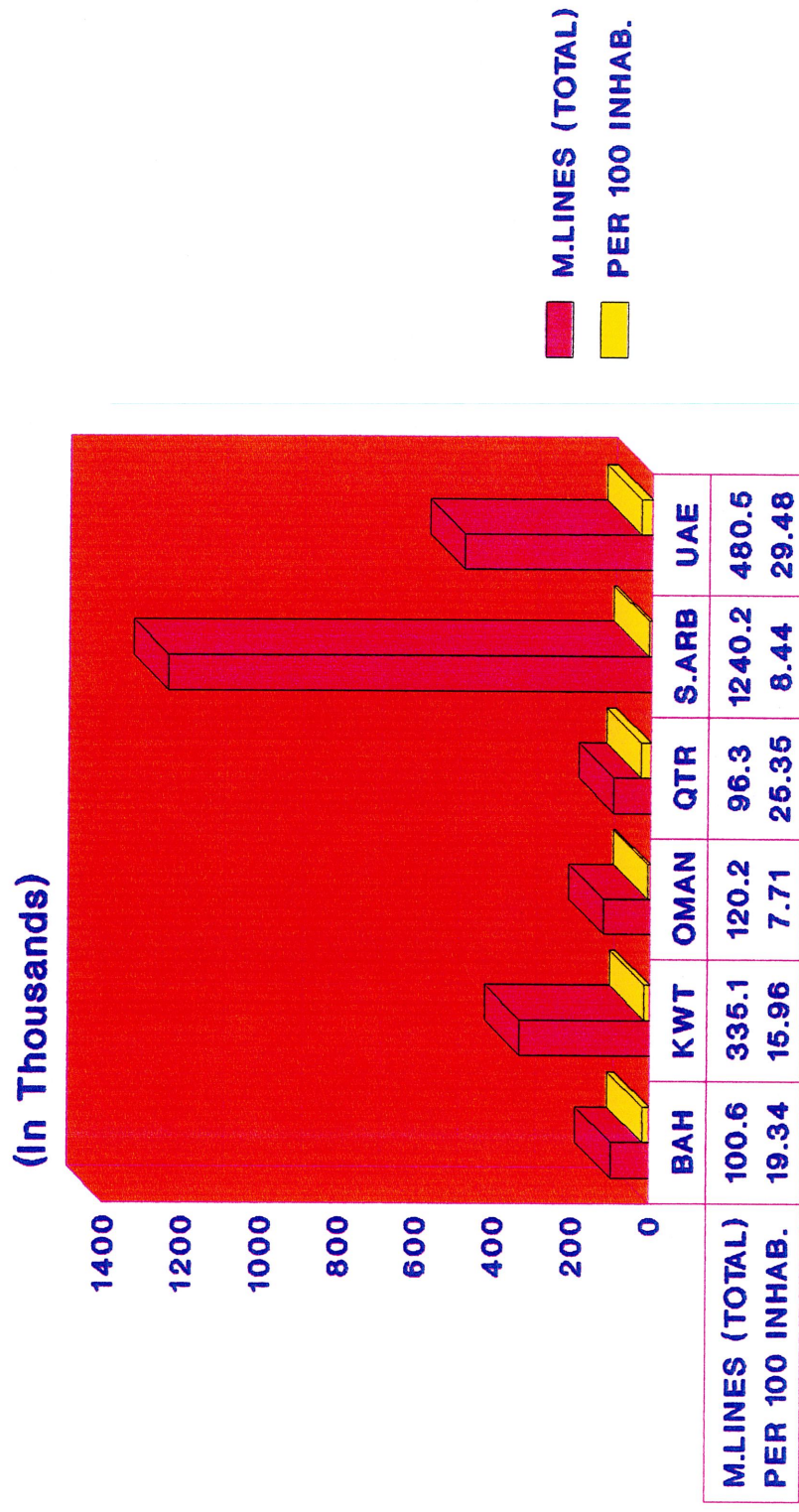
(FIGURE - 2)



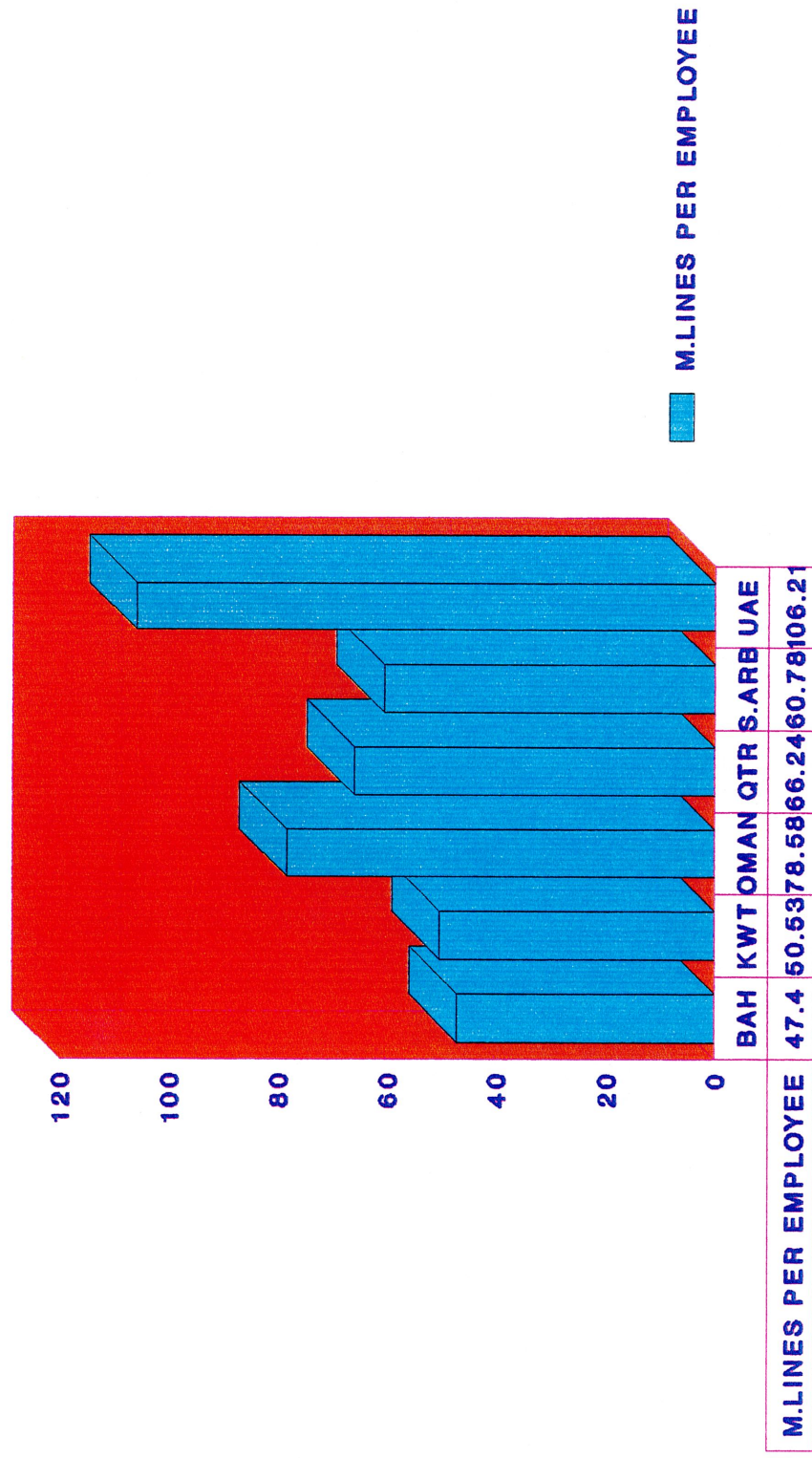
BASIC INDICATORS (1991)

GCC COUNTRIES

(FIGURE - 3)



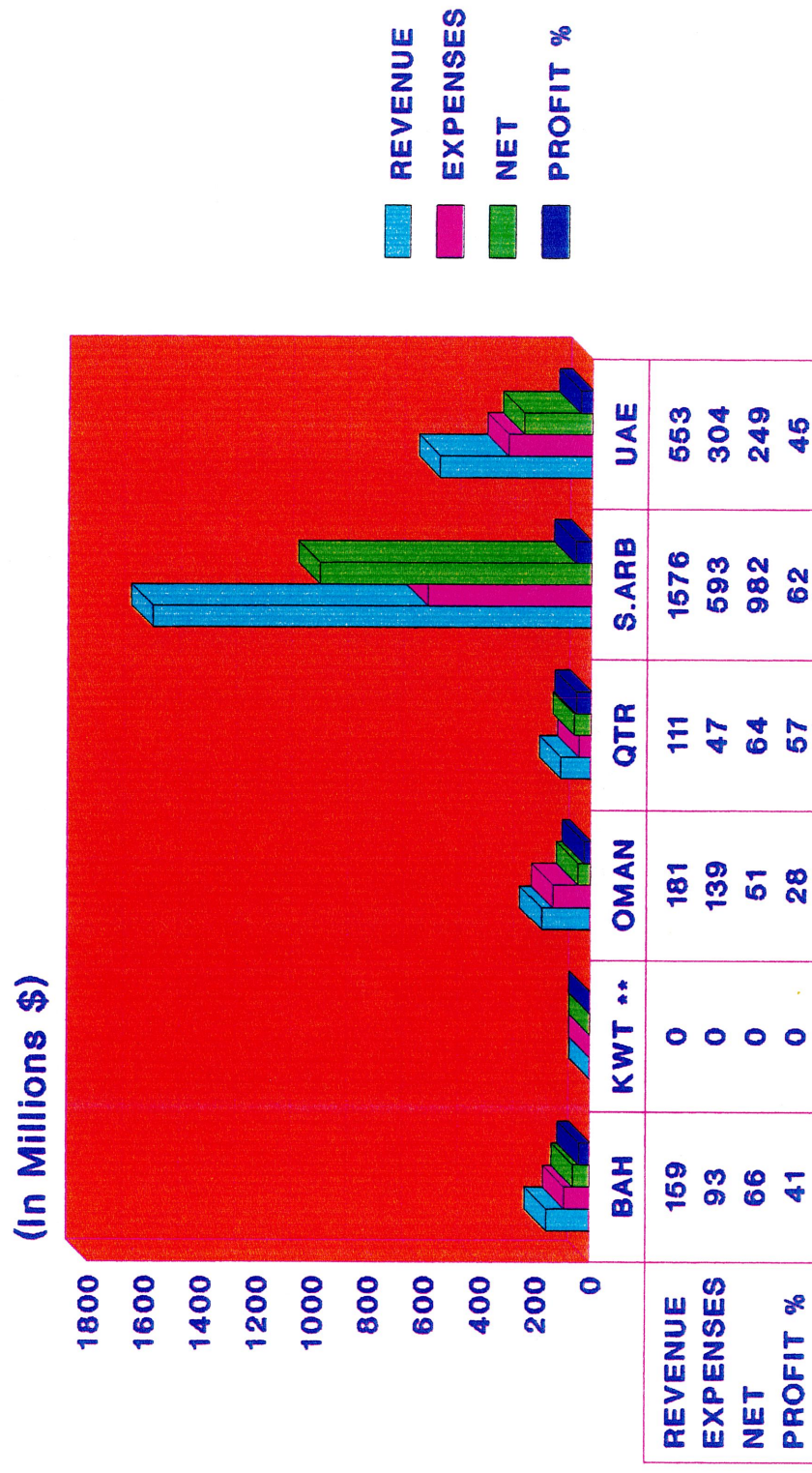
EMPLOYEES (1991) PER 1000 M.LINES GCC COUNTRIES (FIGURE - 4)



REVENUE AND EXPENSES (1991)

GCC COUNTRIES

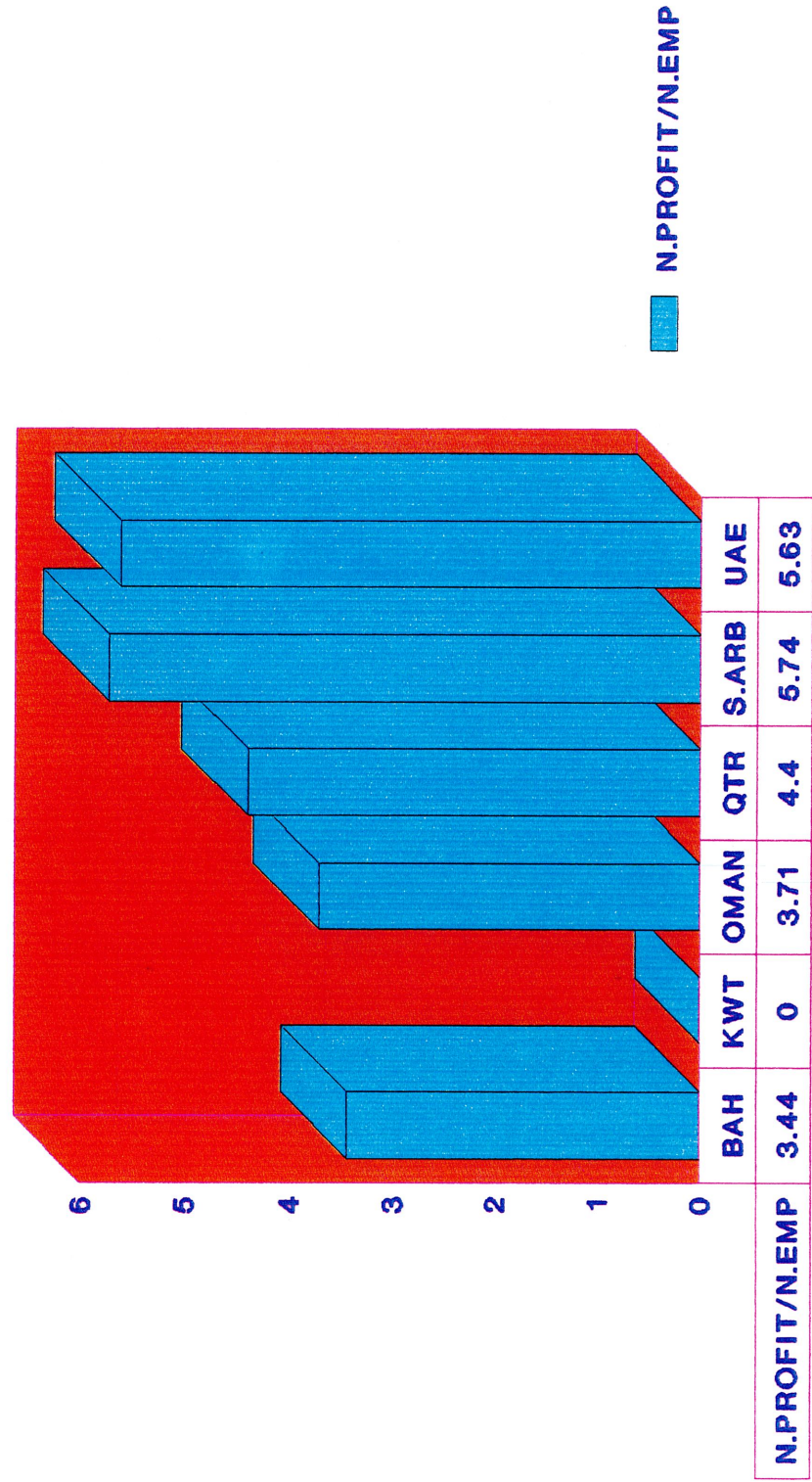
(FIGURE - 5)



NET PROFIT/N. EMPLOYEES (1991)

GCC COUNTRIES

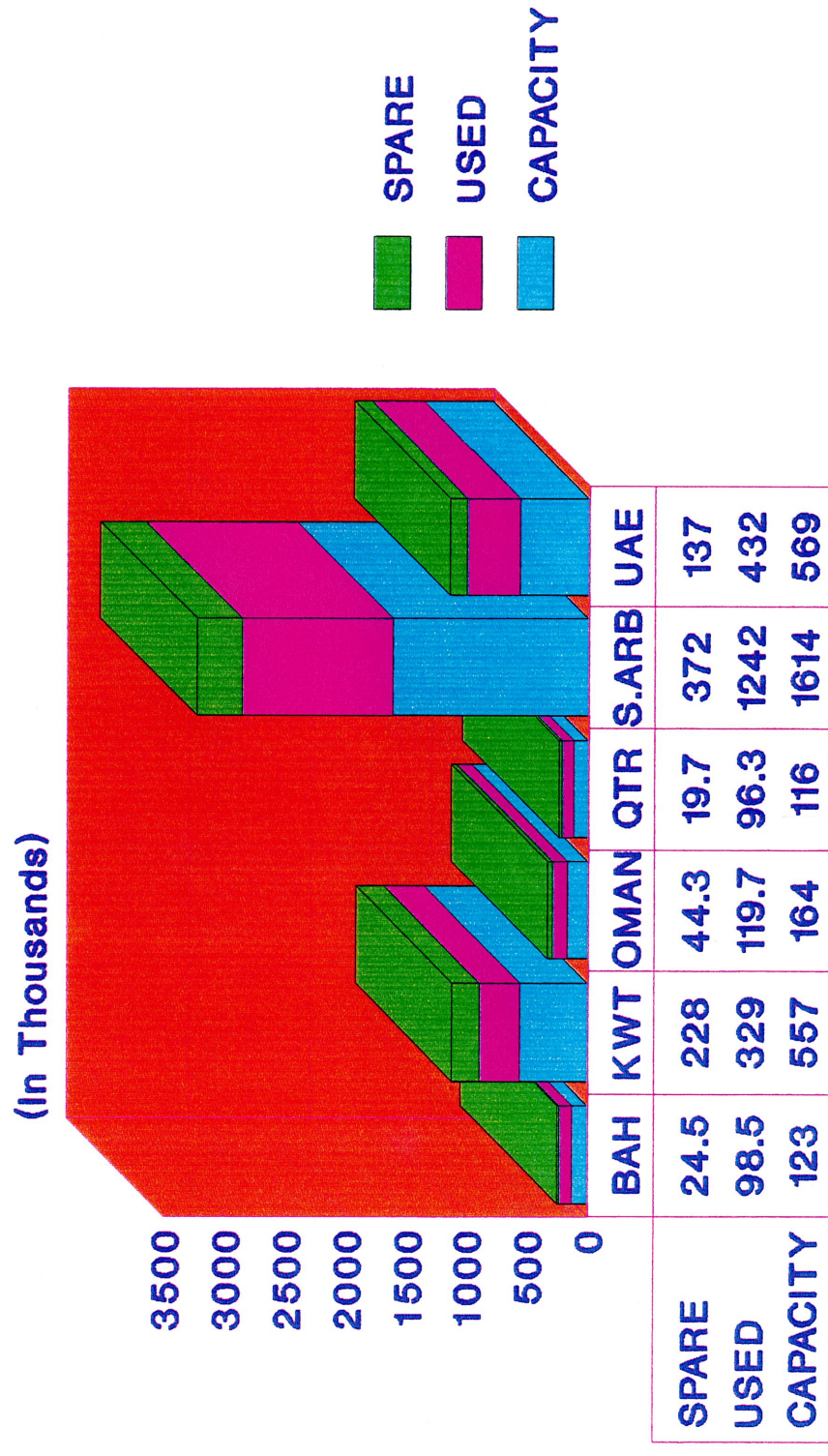
(FIGURE- 6)



LOCAL TEL. NETWORK CAPACITY (1991)

GCC COUNTRIES

(FIGURE - 7)

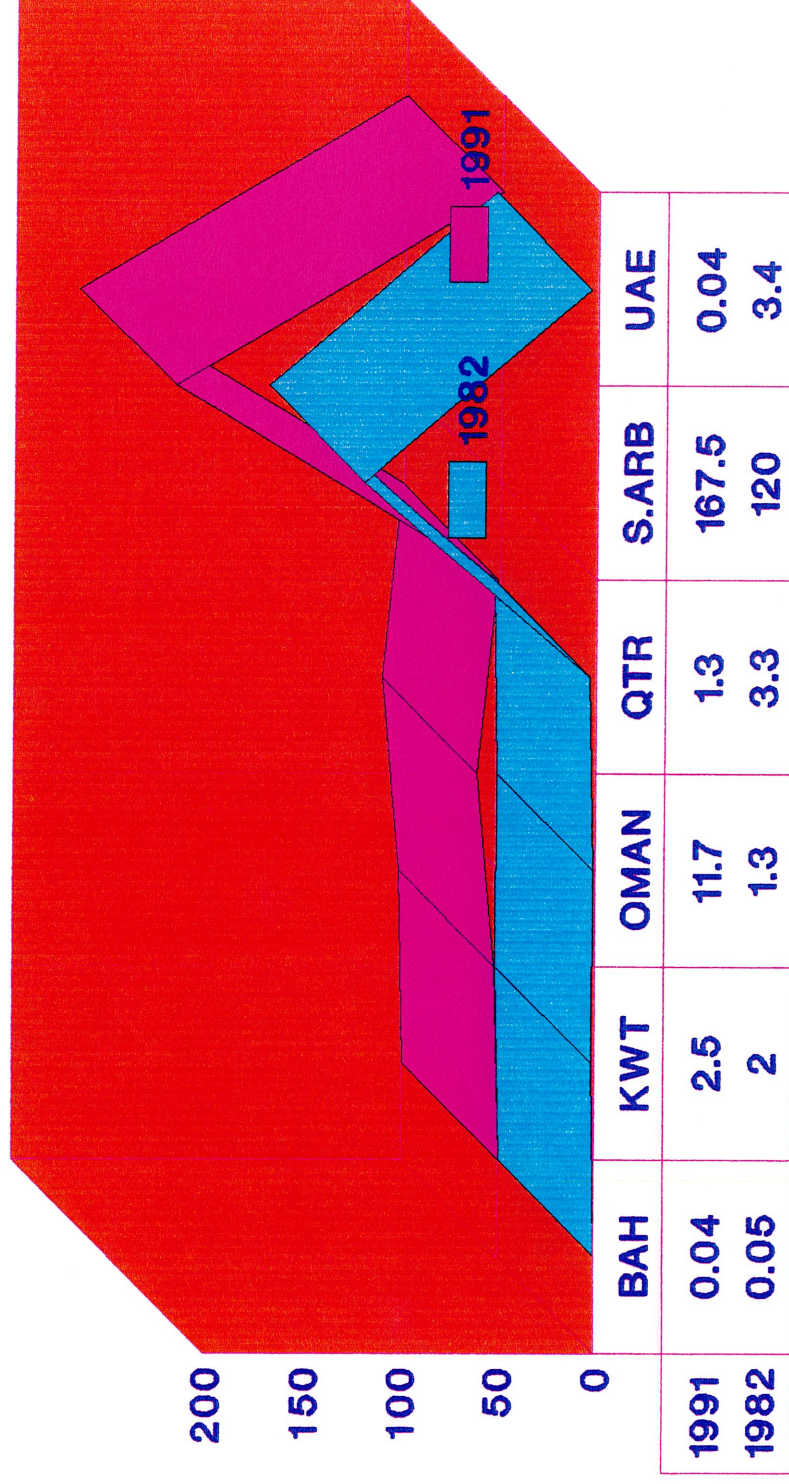


WAITING LIST FOR M.LINE (82-91)

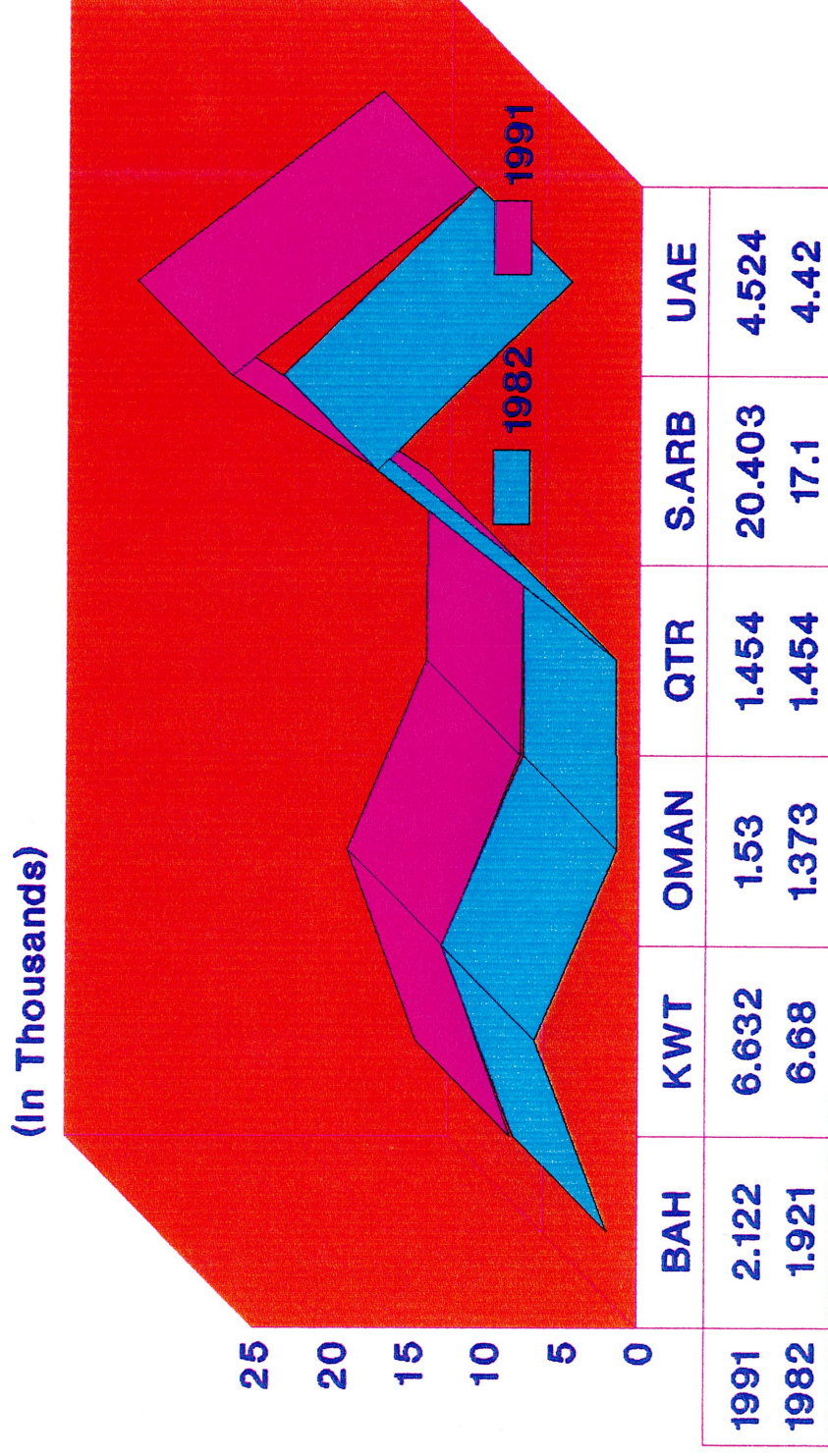
GCC COUNTRIES

(FIGURE- 8)

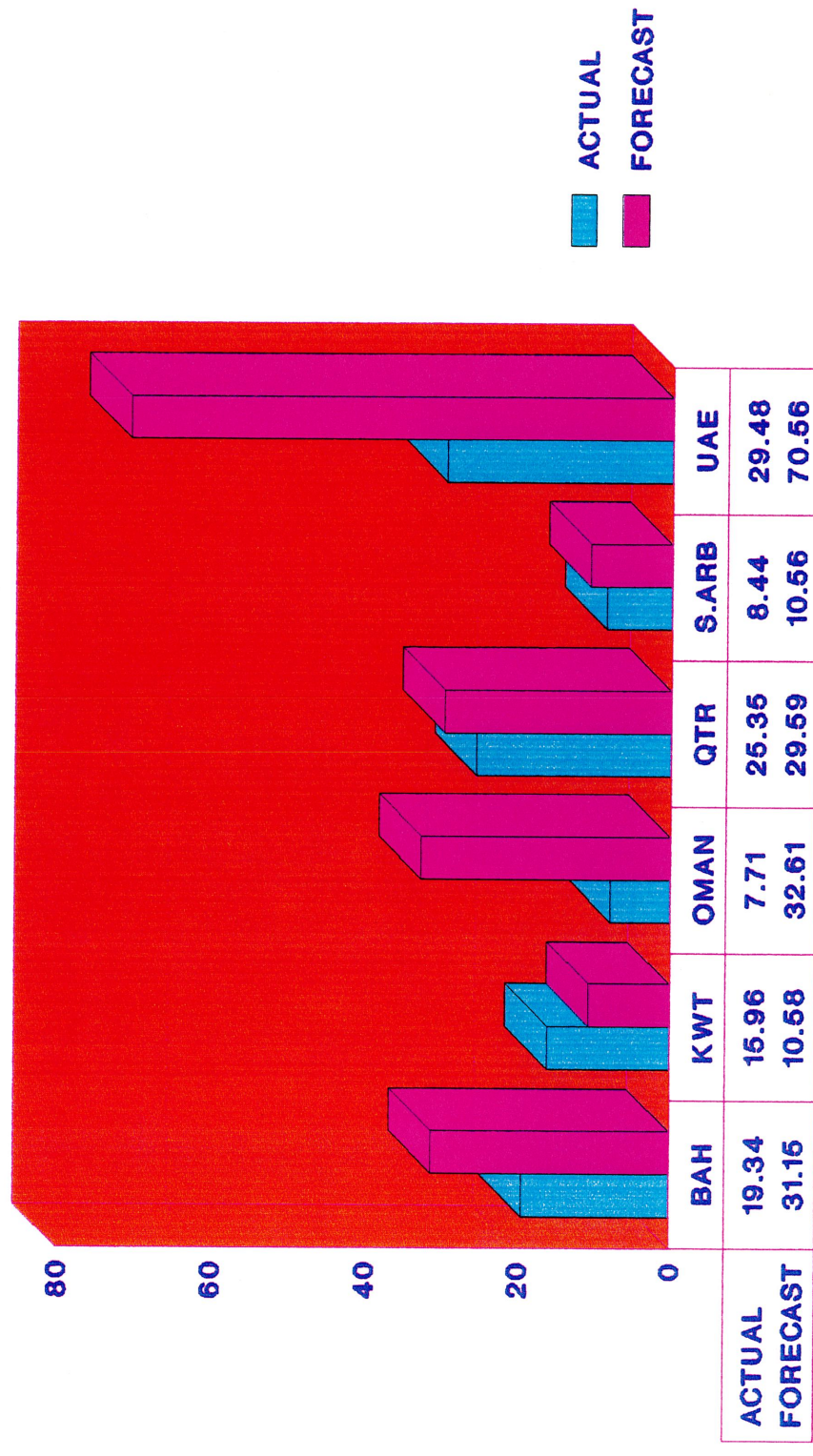
(In thousands)



NUMBER OF EMPLOYEES GCC COUNTRIES (FIGURE- 9)



PROJECTION MAIN LINES PER 100 INHABITANS GCC COUNTRIES (1991 - 2000) (FIGURE- 10)



CHAPTER 7

- 7.1 : A General Summary Of the Findings
- 7.2 : Analysis of the Findings in Support of
the Propositions
- 7.3 : An Inductive Framework that Emerged
from our Analysis

Analysis And Discussion Of Our Overall Findings

In previous chapters, we comprehensively dealt with the various details of how we carried out the study, the measures we used for the different variables, the testing procedures that we adopted, and the detailed results that we obtained. In this chapter, we first introduce some general questions so that an overall review of the study that we carried out, might elicit, and then in the rest of the chapter we analyze and discuss a portion of our general findings.

Several questions can be elicited, such as: what were our overall findings? Were our propositions validated? What did the results imply for the theoretical framework that we used? Were there policy implications to be derived from the results, and if so, could these be specific to issues of both business policy and public policy? And, finally, what were the principle contributions, limitations, and possible extensions of a study such as this? We address each of these questions in turn in Chapters Seven and Eight.

Issues relating to the marginal and public policy implications and the limitations and contribution of the study, deserve detail and separate discussion, and hence are covered comprehensively in Chapter Eight. The other issues are discussed in this Chapter.

7.1 : A General Summary of the Findings:

The general results that were obtained are shown in Table 20.

Table 20: Actual Relationships Between the Measures of the Dependent and Independent Variables.

Measures	ELECSWCH	REV MAX	COST MIN
ELECSWCH	IDENTITY	2	2
EMPIND	1	2	0
PCTMERTO	2	2	0
RLEXOPEV	2	2	1
BUSLNPCT	2	2	0
TIME	2	0	2

0 = Insignificant Relationship.

1 = Negative and Significant Relationship.

2 = Positive and Significant Relationship.

Our results for the explanatory power of the independent variables showed the following trend, as shown in Table 21. It is reported with regard to the eleven regressions we ran using LAR techniques. In these eleven equations there were a total of one hundred and twenty four explanatory variables.

An analysis of the table reveals that 35% of all the explanatory variables were significant at 99.9% level of confidence, and 40% of these variables were significant at 99% level of confidence, and 44% of all the explanatory variables were significant at above 95% level of confidence, which was our minimum acceptable level.

Table 21: Cumulative Proportion of Variables
Below A Certain p Value.

p Value	Number Of Significant Variables With p below This Value	Cumulative Proportions of Variables with p Below This Value
<.001	38	.35
<.01	49	.40
<.05	55	.44
1.00	124	1.00

7.2 : Analysis of the Findings in Support of the Propositions:

We had Five propositions which guided our empirical research. In our opinion, the track record of the results in validating these were as given in Table 22.

First we had proposed that telecommunications firms in competitive environment would have a higher propensity for innovativeness. This we found to be substantiated. The impact of a competitive environment led the (PTT's) in the Gulf Region to have increased level of electronic switches, both compared to other (PTT's) who may have been in less competitive environments, and over time.

Secondly, we had proposed that the increased propensity for innovativeness would lead to increased levels of corporate performance. This too was substantiated, albeit with different levels of significance, for both the measures of corporate performance. A higher level of electronic switches not only enabled (PTT's) to be more affective

in raising revenues, but also allowed them to minimize costs and increase efficiency. Such a finding would also enable affirmation of an unenunciated proposition that diffusion of new technology led to the betterment of corporate performance.

We found that the impact of electronic switching on cost minimization was greater than on revenue maximization, and this suggested that firms were able to increase their propensity for process innovations which would reduce costs rather more significantly than their propensity for product innovations.

Such results also seemed to tie in with Abernathy and Utterback's contention (1988) that during the early years of the transition of a stable environment into a turbulent one, as had happened in the telecommunications industry during the period of 1984 to 1989 that we looked at, firms would seek all avenues to reduce costs, and then when the environment became truly dynamic would try to start tailoring to customers' specifications. We noticed that in a cost-minimization oriented process, innovativeness was important in the period up to 1989. However, if we extended our study beyond that period, we would probably find that customer-oriented, product-innovativeness was now the strategic predisposition of the (PTT's) Future planning.

The above findings substantiated the general notion that market structures did impact on propensity for innovativeness. A key issue in the market structure and innovation debate was whether demand characteristics, such as elasticity, mattered, as suggested by Kamien and Schwartz (1982) and Meyer, et al (1980). In our tests, we used measures capturing market micro characteristics which would also display higher elasticity. By estimating significant parameters for these measures, we showed that the Kamien and Schwartz (1982) and Meyer, et al (1980) views were not invalid.

However, what was more interesting was the pattern whereby they did so. We found that the measures for the competitive exposure variables were generally more significant in explaining variations in the proportion of electronic switches. When we carried out a detailed analysis of the effects of each of these measures for every time period, we found that the measures for competitive potential were significant in the earlier phases of the transition to a competitive environment, and such results were evocative of the "demand pull" hypothesis that underlies most market-structure and innovation literature.

The competitive exposure measures were significant in the latter cross-sectional periods of our study, and such findings suggest the operation of a "push" process

(Leibebstein, 1969) whereby in an actual competitive environment, PTT's would see their competitors investing in newer technologies. This would increase the propensity for innovativeness of firms facing greater exposure, as otherwise they would lose out to their rivals in offering more advanced services, and also have higher costs; our data thereby provided support for an alternative view of how a competitive market environment influenced the propensity for innovativeness in the Gulf Region Telecommunication Industry.

We have referred to our use of two measures for corporate performance; the first being a measure of revenue maximization, and the second a measure of cost minimization. Our test strongly substantiated the propositions, that a competitive environment would lead (PTT's) to improve their corporate performance, as measured through revenue maximization criteria. This was when comparing firms to others who were in less competitive environments, and over time.

The measures for both the competitive potential and competitive exposure variables were significant. Over time there were certain changes in significance for some of these; however, their overall effect was strong and hence we were able to confirm two significant portions of our propositions. First, we substantiated the fact that a competitive market environment provided the necessary

incentives, through its structural and process mechanism, for a firm to maximize its revenues. Secondly, over time, the changing nature of the competitive environment also influenced firms to minimize their costs.

These results were further substantiated by some of the specific cases that we analysed briefly in Chapter Six, and this analysis seemed to suggest that with the opening up of markets, firms sought to take advantage of the competitive environment in different and unique ways to improve their overall performance.

Table 22: Propositions of the Study and whether Substantiated.

No	Details of Proposition	Validation Equation No	To What Extent Substantiated
01	Proposition One	1 and 4	Partly substantiated with mixed results.
02	Proposition Two	2 and 3	Partly Substantiated.
03	Proposition Three	4 and 5	Fully Substantiated.
04	Proposition Four	6 and 7	Fully Substantiated.
05	Proposition Five	1 and 4	Fully Substantiated

Figure 11: Influence of the Exogenous Variables on the Endogenous Ones.

Exogenous and Endogenous Variables	Competitive Potential	Competitive Exposure
Propensity for Innovativeness	Some Influence	Much Influence
Revenue Maximization Score	Much Influence	Much Influence
Cost Minimization Score	No Influence	Some Influence

7.3: An Inductive Framework That Emerged from Our Analysis:

Interesting aspects of inter-firms behavioural dynamics were also revealed by our results. Our analysis is displayed in figure 11, and we used two dimensions to encapsulate our arguments. The first is related to the state of environment whether allowing competition. The second is related to whether the structural characteristics defining a competitive environment had firm specific impacts, or whether such impacts were diffused.

We carried out a detailed analysis of the various measures by time period and found that even in the periods when regulation was present, some measures influencing revenue maximization, particularly those related to competitive exposure, were significant. We could speculate that due to our strategic choice reasons, firms exploited whatever opportunities came their way in the

environment they operated in, irrespective of the fact that they were in a regulated environment or not.

As a regulated Environment unravelled and become more dynamic, the measures for competitive potential now became more significant, and not always positively. This suggested a shift in the (PTT's) predisposition; formerly, firm specific measures had seemed important in influencing the performance because firms were limited in their geographical scope to exploit existing revenue-earning opportunities. Now, however, the general features of the environment were seemingly determining the revenue maximizing behaviour of (PTT's), because the opening up of more markets meant increasing the scope of (PTT's) to earn greater revenues. As a result, employees would seek whatever opportunities they could, to contribute to these revenues and enhance their own visibility within the firm.

When it came to explaining performance measured by cost-minimization criteria, the general results were not fully as per expectations. We noticed that cost minimization scores had improved over time: nevertheless, there were period to period fluctuations in the scores and no steady, linear trend of betterment. It seemed that, as long as regulation existed, increasing costs could be passed on to customers. However, with deregulation, (PTT's) would start to think about being cost efficient because

regulatory protection was dissolving, and attempts to start minimizing costs led to erratic patterns in the behaviour of costs.

While we were unable to fully substantiate our expectations that a competitive environment would have a direct impact on cost minimization scores, and thereby on efficiency, the results were not incomparable with other studies using regression analysis tried explaining efficiency (Little, Mazumdar and Page, 1987; Martin and Page, 1983; Pitt and Lee, 1979; Tylor, 1979), and some of our findings relating to this measure, are of significant importance.

First, we found that the general atmosphere of a competitive environment seemed to spur early improvements in efficiency, rather than any specific environment characteristics. Such findings were also reported by Oniki, Oum and Stevenson (1990) and Crandall (forthcoming), and our results are therefore consistent with extant studies on the impact of competition on productivity and efficiency in the telecommunication industry.

The next finding of interest revealed by our analysis was the impact of different measures over time. Where as in the early time periods, firms with specific measures provided contradictory or inconsequential insights, in the post-deregulation period, these measures for

competitive exposure had a strong, direct impact on the cost minimization scores. This led us to speculate again about changing intra-firm dynamics in a competitive environment.

Where relatively easy-pickings in the pre-deregulated era had not inspired cost cutting, in the more competitive era the economics of resources scarcity (Pfeffer and Salancik, 1987) seemed to matter more and more. While employees would still seek to maximize revenues and enhance their intra-firm visibility, cost-control became important as cheaper substitutes offered by competitors would induce customers to switch to them. Hence, by increasing competition, employees reduced inertia so that the firm could simultaneously improve both its revenue maximization and cost minimization abilities.

We, thereby, also found a possible way to address the problem of the non-linearities in the behaviour of the cost-minimizing scores. In the early phases of the study, firms were operating in an environment which, though regulated, did not constrain the availability of resources. Hence, incentives became stronger; however, (PTT's) in the Gulf Region they were unable to completely alter their behaviour immediately.

There was a period of learning and adjustment to the new environment when cost-minimization scores fell, and we found negative changes in the performance of the

(PTT's). As the competitive environment later became one, (PTT's) learned to operate in such situations. Where earlier, the economics of relative affluence had not inspired cost minimization, now the economics of relative scarcity (Lawrence, 1987) inspired firms to learn, adjust and improve their cost minimization scores.

CHAPTER 8

- 8.1 : Recapitulation of the Scope : What was Attempted in this study
- 8.2 : Implications of the study for Theoretical and Empirical Research
- 8.3 : Managerial and Public Policy Implications of the Study
- 8.4 : Limitations, Extensions and Contributions of the Study

Conclusion And Implications

Recapitulation of the Scope: What was attempted in this study?

In this study we set out to examine whether the onset of a competitive environment, in the telecommunications industry in the Gulf region, has made (PTT's) generally perform better.

Our research question was motivated by two factors. First, several nations in the world were undertaking measures to liberalize and open up their economies. In the Gulf Region, several years of deregulatory moves occurred in various sectors of the economy. A primary factor underlying such policy reforms was the expectation of allocative and productive efficiency. We were interested in finding out whether corporate performance improved in the Gulf Telecommunications Industry following such reforms, and whether the results of the study would shed light on the actual outcome of the liberalization process.

Secondly, literature dealing with the impact of environment on firm performance, had primarily adopted a variance approach which merely accounted for the variation in a firm's performance (Lenz, 1981). We adopted a process approach, wherein we tried to explain the difference in (PTT's) performance by developing a theoretical framework including causal relationships between environment and

firm performance. Thereby, we were also accepting a challenge in strategy research suggested by Ginsberg (1988) that researchers ought to model and analyze environmental changes and its impact on firms.

Based on a priority, deductive theory, guided by the postulates and assumption of x-efficiency theory, we articulated a framework which would enable us to generate propositions that would answer our empirical question. Secondly, we expected that the general characteristics of a competitive environment which we labelled had competitive potential, and the firm specific characteristics which we had labelled as competitive exposure, would directly impact on both a PTT's propensity for innovativeness and its performance; we also expected that such impacts would exacerbate over time.

Guiding us in our derivation of the framework, were four essential elements necessary for such a task to be complete. These were; What, How, Why, Where and When (Whetten, 1989). We considered the two independent variables-competitive potential and competitive exposure, to adequately capture the nature of exogenous phenomena, and the two dependent variables-propensity for innovativeness and corporate performance, to represent the endogenous attributes of firm behaviour on which the independent variables would impact.

These variables represented the "what" factors which we considered necessary to explain the phenomena comprehensively, yet retaining individuality in the overall.

The second element was "how". We related dependent and independent variables by specifying that there were certain structural and process characteristics associated with a competitive market. As a result of these characteristics, the exogenous variables would directly impact upon the firm levels endogenous variable; thereby, enabling us to suggest the functional linkages between a competitive market environment and firm level outcome, and introduce notions of causality between them.

The third element was "why". Had we combined only the 'what' and the 'how', we would have arrived at a model which would have enabled us to derive the propositions necessary for our study. However, this would have led to an empirically driven discussion of our findings, without in any way shedding light on the underlying reasons for arriving at the results obtained. We would have merely obtained a descriptive framework generating perhaps some interesting patterns of the phenomena.

But one of the prime motives in undertaking this study was explanation. Incorporating the "why", based on the underlying assumptions and postulates of the x-efficiency theory, enabled us to provide richer connections between

the exogenous factors and the endogenous outcomes. We were able to develop plausible and cogent explanations as to why a competitive market environment ought to have certain impacts on PTT's behaviour and performance, and thus provide logical behavioural linkages between that and the 'how' factor.

The final element was a composite of "where and when." Such contextual and temporal factors would limit the range of generalization of our study. A primary objective in undertaking this study, as mentioned earlier, was to study the impact of liberalization to understand and explain what occurred in the Gulf Region Telecommunications Industry following liberalization measures, over a period of time. Hence, we were problem-driven in our approach. We identified some of the structural and process factors that would generally impact on firms, and linked these with some critical micro-economic assumptions to develop a model, explaining the propensity for innovativeness and corporate performance of the GCC State PTT's.

While the theoretical framework was developed deductively, it was set in the context of market liberalization and strategic changes in firms, following a shift in environment. Hence we could argue that our study was not restricted by the context that we derived and tested our propositions in, but could be equally applicable in

other similar contexts, where market liberalization and changes in the competitive environment were taking place.

8.2 : Implications of the Study on Theoretical and Empirical Research

Our research had certain implications on the theoretical framework we adopted. Our logic in developing the framework was based on x-efficiency theory. Using DEA methodology, we were able to identify the existence of x- inefficiency in the Gulf Region Telecommunications Industry, and also show how it improved over time. We showed, how in the case of certain performance measures, there was a clear, inexorable movement to the efficiency frontier, but that in the case of others, the pattern of movement was very complex and divergent compered to our expectations. In general, we were able to essentially validate the basic postulate of X-efficiency theory, that increasing competition leads to better firm performance.

In theory, the relationship between the competitive environment and a PTT's performance was assumed to be linear, or curvilinear beyond a point where diminishing returns to pressure would set in (Frantz, 1988; Lawrence, 1987). What we found, was not any particular linear or curvilinear pattern, but the functional form describing that the relationship could be classified as polynomial over time. This suggested the existence of critical behavioural phenomena which needed to be incorporated into the framework for future researchers to explain change

processes better.

A start could be made towards such incorporation by looking at the two primary components of X-efficiency which were discretionary efforts and inertia. It seemed that discretionary efforts were more relevant in bringing about improvements in revenue-maximizing scores, while the reduction of inertia, to bring about improvements in cost minimization scores, was not so marked. A detailed analysis, based primarily on the investigation of inertia and its relationship with a changing competitive environment, would enable us to depict a framework to explain the non-linearities that were present in the trends of cost minimization scores.

Another possible study would be to analyze the residual generated from our regressions. We found non-linear patterns, and also heteroscedasticity which we attempted to vitiate using LAR techniques. From the analysis of this residual which would separately shed light on firm specific factors that impact on corporate performance, we could use the residual as dependent variables, and a variety of firm specific independent variables to analyse the strategic behaviour and performance of PTT's.

From an empirical standpoint, our work can be split into two broad categories. First, it belonged to the category which dealt with the issue of increasing competitive forces leading to improvements in X-efficiency. Within

this category, studies were carried out using special econometric or management science techniques to assess relative efficiencies and then were attempted to explain the underlying variation therein. A major study of that was Carlsson's (1972) research on the Swedish economy; our study was similarly strong in reiterating the ability of such approaches with their useful results which validate the questions motivating this genre of studies.

Secondly, it also belonged to the literature dealing with empirical examinations of the consequences of deregulation. Empirical studies of the consequences of market liberalization in the Gulf Region's Telecommunications studies were very few and far between, notwithstanding the magisterial efforts of Bolter (1984) and Huber (1987) in analyzing the industry, as compared to the airlines industry where the study of the impact of deregulation itself resembled a cottage industry. Our study was one of the very few that examined the whole regional operating sector of the Gulf Region Telecommunications Industry.

8.3: Managerial and Public Policy implications of the Study:

The principle assertion of this study was that a competitive environment was a source of pressure on firms which ensured a greater level of corporate performance. It did so by motivating productivity and innovative

oriented behaviour. By not proving such an assertion to be false, we showed that changes in the market structure of the telecommunications industry brought by deregulation in telecommunications had liberated efficiencies. Actual consumer welfare could be gauged in terms of price declines, and there were many studies, notably by Bailey (1986) and Perl (1989) which showed that allocative efficiencies had increased, following deregulation in many industries.

In this study we chose the individual (PTT's) as the unit of analysis, and gauged the impact of regulatory policies at the PTT level. Since the main assertion was not disproved, it meant that the reorganization of the Telecommunications Industry was indeed beneficial to society, because resources, earlier being wasted through monopoly behaviour, were now being utilized, and the assumption that deregulation will induce efficiency was not belied.

Apart from the public implications which we just covered, there were certain managerial policy issues that we felt were important. A change from a deregulated to a competitive environment meant that PTT's were now operating in a market where their customers could shift to other service providers. It was no longer a monopoly situation which would ensure "that quiet life" for managers and employees within the individual PTT.

Vernon-Wortzel and Wortzel (1988:637) described organizational culture explanations for X-efficiency, and using these we would expect that in the transition from a regulated industry to a competitive one, there would be massive organizational culture changes as the telecommunications (PTT's) were adjusting from "quiet life" of a monopolist to aggressive market-oriented companies. Firms which were originally reliant on regulators for a large part of their success, and adept at political behaviour without much concern for economic outcome, would now have to deal with aggressive competition from other industry entrants trying to attract customers-the monopolists had always taken for granted. In our study, the dynamics of changing performance would support such behavioural explanations.

Some reasons that advanced from such outcomes could be as follows. Erstwhile, intra-firm norms which had been bureaucratic, even patronizing, in a monopoly environment would give way to the development of norms encouraging customers satisfying economically efficient behaviour. In this transition, there would be competing pulls between various intra-firm constituencies. These pulls might be between "old diehards" of the monopoly culture, who operated in what Galbraith (1983) described as an "upstream" phase where the basic product was a commodity, and who saw network operations as all important,

against vis-a-vis radical "young turks" found in a competitive environment, operating in a "downstream" phase where the product was differentiated, and up saw that marketing and an external orientation were now all important.

Which of these would gain the initial upper hand would be an empirical issue. However, there was evidence emerging, that the local telephone companies were shifting their "centres of gravity" from an upstream orientation to a downstream one, customer-oriented activities were the *raison d'être* for the existence (Charalambides, Armacost and Koys, 1990), and such strategic changes were responsible for improvements in their performance.

8.4: Limitations, Extensions and Contributions of the Study:

Because this study was limited to the Telecommunications Industry, it could be called a case study in spite of the fact that all major (PTT's) in the industry were studied over a period of time. If so, a critical issue was its external validity. Because a unique context was being studied, the findings would not be statistically generalized to other public utilities in the Gulf Region Telecommunication PTT's elsewhere, where the conditions were very much different. Rather, the study's results could be used for "analytical generalization," in validating the assumptions of the theoretical framework used to address the question (Yin, 1984).

If this study was treated as a case, we are faced with the paradox of generalizing from a single situation. A way to describe the research process would be "internal analysis," as Lipsett, Trow and Coleman (1956) had. This process looked at variations occurring within the system; in this instance, it was a substitute for variations between systems. This was akin to an experiment, where the researcher, varied conditions under which a system existed, or when the evolution of an object was observed over a period of time.

Since we had looked at the period of 1985 to 1990 within which to obtain our cross-sectional samples, to make sure that our "internal analysis" and the conclusions that we drew from these were valid, a follow-up study would be to use data for the years 1992 to 1993 to revalidate the model. This would enable us to reach a conclusion that, indeed, our original conclusions were not invalid or erroneously drawn.

Internal analysis went behind the overall generalization of results to the process through which the propositions held. By validating the structural model, the process assumptions in this case, those underlying a competitive market structure, were not shown to be erroneous, and internal analysis validated the generalization of the results. Attention was thereby focused upon the underlying processes operating within

the system. This allowed a further detailed study at a micro level, by pointing the way to key issues involved when dealing with a problem of market incentives and performance outcomes; such an examination could thereby lead to a deeper understanding of the phenomena, and more fundamental generalization (Lipestt, Trow and Coleman, (1956)).

While we attempted to get behind overall generalization to the underlying processes, we were rigid in our model specification, positing only one-way causality. In this way we tried to obtain parsimony in explanation. However, this was at the risk of ignoring or not recognizing that other factors may have provided equal justification for the results obtained. Consequently, the search for elegance and parsimony may have led us to sacrifice some degree of comprehensiveness. Nevertheless, in extensions of the study, we could factor-in other exogenous variables, which would then enable us to obtain richer explanations of the underlying phenomena.

One possible extension would be the operationalizing of some of the (PTT's) level attributes capturing constructs such as discretionary efforts, inertia, and overall cultural changes. To do this, we would carry out clinical case studies of actual firms which faced a changing competitive environment. Precedents for such an approach

exist in several studies that Lawrence and Dyer (1983) draw upon in their work, and in the telecommunications industry a start has been made by Schlesinger, Dyer, Clough and Lanau (1987) who examined U.S. West group in the wake of deregulation.

In developing the model, and an explanation for the processes underlying the model, it is perceived that this study made certain contributions. First, it tried to fill in some gaps in the study of knowledge, by attempting to carry out specific theory-based connections between deregulation, competition and X-efficiency and corporate performance.

Secondly, it tried to remove limitations in previous formulations of the question as to whether competition creates impacts on productive efficiency and corporate performance. Explicit attention had not been paid towards the key process components underlying competition. Similarly, the structural characteristics of a competitive environment were each the subject of a separate stream of research. This study integrated the structural and process characteristics of a competitive market environment into an unified framework, which was then used to derive propositions for the study.

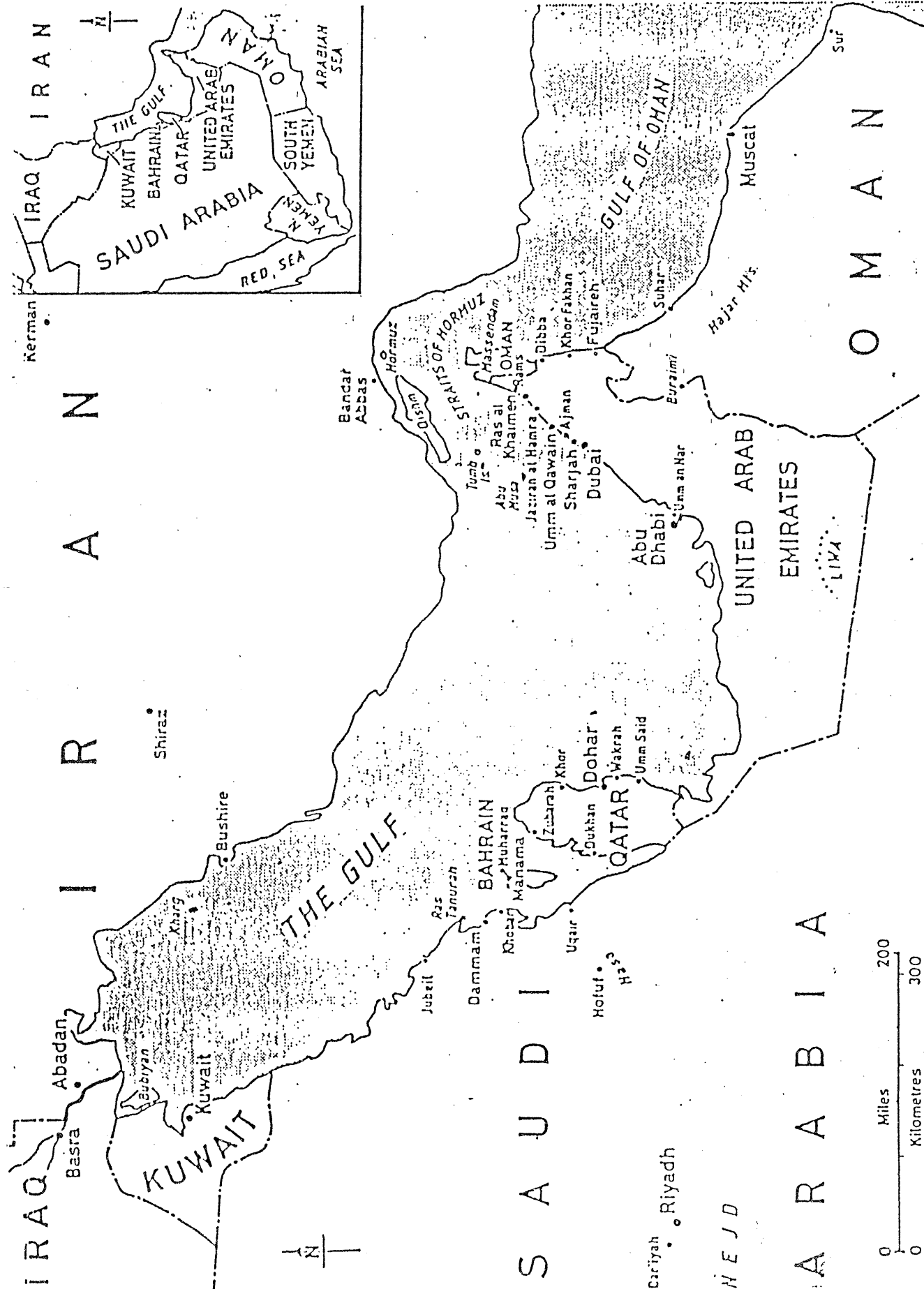
Third, feature of this study was methodological. We had set our study in a specific framework derived from X-efficiency theory. Using DEA we were able to assess

whether X-efficiency was being liberated or not by a competitive environment, and analyse the movement of firms from an inefficient state to an efficient one. The DEA technique allowed (PTT's) level efficiencies to be calculated first. We could analyse what the impact of deregulation and competition had been on single PTT's and the whole industry. This permitted us to avoid an often made ecological fallacy, which was to estimate relations at one level, say the industry, and extrapolate them to another, say the PTT. Such distortions arose when PTT's level analysis was purely aggregated for computational purposes and an industry drawn conclusion.

A combination of DEA and regression techniques allowed for explanations of PTT level and industry performance. Using these, we showed not only how the performance of an individual PTT had changed, a first order description of what was happening, but also arrived at a second order of explanation on the complex issue as to whether a competitive environment influenced the performance of firms. Thereby, we attempted to not only understand the impacts of deregulation and competitive environment in general, but also seek some fundamental explanations of underlying phenomena, and in doing so we strangely believe that the results of the study have turned out to be useful, relevant and interesting.

APPENDICES

- A Location Map
- B General logic of the theory and The Structural Model
- C Diagram of the Structural Model to be tested
- D The Questionnaire.
- E Medium Projection for GCC States Population & Average
Annual Growth Rate % (1950 - 2000).



APPENDIX B

General Logic Of The Theory And The Structural Model

External Independent Variables:

Market Structure Characteristics.
Influencing Standards of Purposiveness.

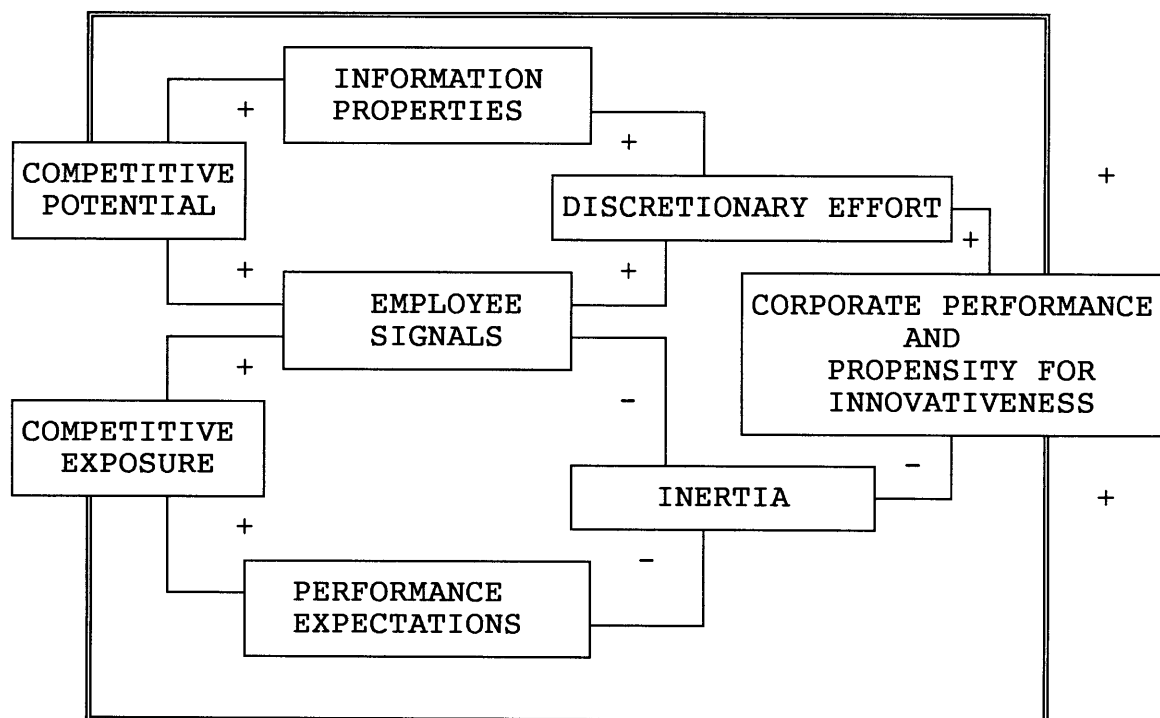
Process Dimension Associated With
Market Structure Characteristics

Mediating Variables:

Intra-Firm Behavioural Assumptions.

Dependent Variables:

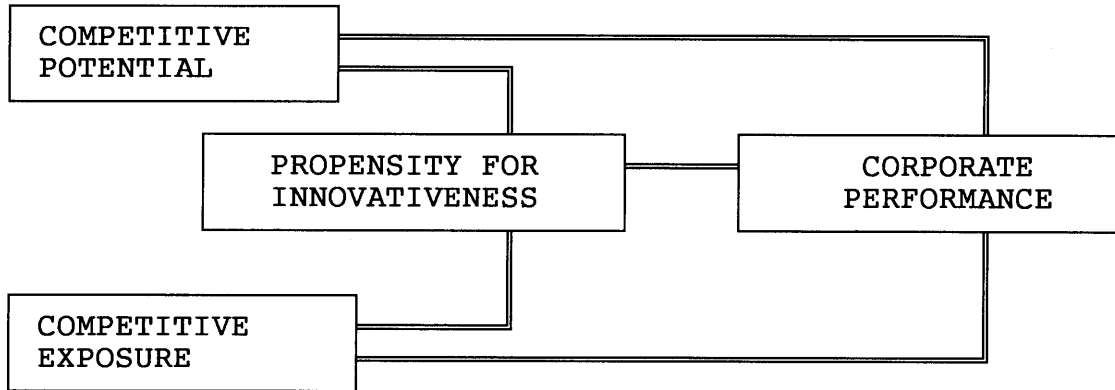
PTT's Level Impact.



- == = Structural linkages to be tested in the empirical model.
- = Logical linkages upholding the underlying theory of the abstract model.
- + = Directly or positively related.
- = Inversely or negatively related.

APPENDIX C

Diagram of the Structural Model to be Tested.



- == = Structural linkages to be tested in the empirical model.
- = Logical linkages upholding the underlying theory of the abstract model.
- + = Directly or positively related.
- = Inversely or negatively related.

APPENDIX D

March 5th, 1993

Dear Sir,

Perfect competition in the Gulf Region among the Telecommunications Bodies (PTTs) lately gave evidence to its Network enhancements using the most highly progressive technology, which can provide customers in the region with utmost services and options to satisfy their necessities and future needs. This sort of competition will lead to customer-advantage and more alternatives.

Your enterprise is one of the major customers using one or more carriers in the Region, distinctively on the International line and your participation in this exercise by completing this questionnaire will assist in addressing your current, future needs and level of satisfaction.

You will be assured of complete confidentiality. The study is deliberately aimed to fulfill the Academic Qualification requirement part, for Master Of Business Administration Degree (MBA) at the University Of Bahrain.

The results of this research will be made available for the University of Bahrain library and all interested customers.

I would be most happy to answer any questions you might have. Please write to me in the address mentioned below.

For any abbreviated word on the questionnaire, full detailed Glossary kept available on page (6) of this questionnaire ready for your reference.

Thank you for your great assistance.

Ahmed Y. Abdulla
University of Bahrain
College of Business Administration
P.O.Box 3151
Manama - Bahrain.

NAME :

TITLE :

NAME OF COMPANY :

TYPE OF BUSINESS :

POSTAL ADDRESS :

AGE :

LESS THAN 18		18 - 25	
26 - 35		36 - 45	
OVER 46			

THE FOLLOWING QUESTIONS WILL ASSIST US IN DETERMINING THE LEVEL OF SATISFACTION OF THE SERVICES YOU ACQUIRED.

1. Please indicate type of service utilized currently:

Leased Circuits (Data)	
Leased Circuits (Voice)	
Packet Switching	
Message Switching	
Video Conference	

2. If your company is using Leased Circuits (Data) please specify the speed:

PLS SPECIFY SPEED

Telegraph		
=< 9.6 Kbps.		
>= 9.6 Kbps		
Others		

3. If your company is using Leased Circuits (Voice) please specify:

Ring Down

Shout Down

Others

4. Please indicate your level of satisfaction with the current carrier (PTT) for the following services:

	Extremely Satisfied	Satisfied	Neutral	UN Satisfied	Extremely Unsatisfied
L.C (Data)					
L.C (Voice)					
Packet Switching					
Message Switching					
Video Conference					

5. If your answer is Unsatisfied or Extremely Unsatisfied please identify reasons:

	Provision of Service	Speed Avail-ability	Quality Of Service	Tariffs (Cost)	After Sales Service
L.C (Data)					
L.C. (Voice)					
Packet Switching					
Message Switching					
Video Conference					

6. If this service is provided by another carrier (PTT) in the region in a better quality that will overcome your existing problem, will you acquire it.

YES NO DON'T KNOW

7. If your Answer to question (6) is YES, and that particular carrier costs you more than the existing one you deal with, can this factor (higher cost) be sacrificed towards better services.

YES	NO	Unable to Decide

8. If your answer for question 6 and 7 is YES, do you feel that such an advanced technology will put you in a rival situation over your competitor?

YES	NO	DON'T KNOW

9. State your awareness level in the existing competition force between the Major (PTTs) in the Gulf Region.

	Extremely Aware	Aware	Neutral	UN Aware	Extremely Unaware
L.C (Data)					
L.C (Voice)					
Packet Switching					
Message Switching					
Video Conference					

10. If your answer in question (9) is Extremely Aware or Aware, please identify the areas in which competition is focused.

*
 *
 *
 *
 *

11. How would you perceive the following (PTTs) in terms of the standard of the outeria listed below;
(Please rank from 1 to 4 where 1 is allocated for the best PTT and 4 for the worst).

(Please study Exhibit-1 page 7 before you answer this question)

Carrier of Selection Factor	BATELCO	ETISALAT	Q.TEL	SAUDI PTT
Availability of Service				
Quality of Services				
Carrier Diversity				
Cost (Tariffs)				
Familiarity/Continuity				
Size Of Network				
Image of Carrier				

12. Have you constantly discussed your Strategic Plan (Future Business Plans) with your existing carrier (PTT).

YES

NO

13. If your answer to question (12) is YES, have your existing carriers, taken the initiatives to tailor their marketing Strategy to suit your needs/wants.

YES

NO

14. If your answer to question 13 is NO, Which carrier in the Gulf Region (PTT) do you think is most appropriate to handle such a task and Why?.

.....

15. Do you think there are some services still not provided by any the carriers in the Gulf Region (PTTs), which might assist you providing your customers with better services? Please state th below.

.....

16. QUALITY OF SERVICE

Quality of service is only one of many factors which affect th choice of international carriers. How do you perceive the following variables in terms of importance?

(Please rank them from 1 to 8 where 1 indicates the most important variable and 8 is the least.)

(Please study Exhibit-2 Page 8 before you answer this questio

Quality of Service Variable	Relative Importance
Circuit Availability	
Circuit Provisioning	
Fault Management	
Provisioning Management	
Quality Of Staff	
Transmission Media	
Billing	
Transmission Performance	

17. If you have any comments and suggestions concerning the overall subject of the questionnaire, please state them below.

.....

Exhibit - 1

Carrier of Selection FactorAvailability Of Service:

The most important factor is the availability of service from the carrier to the required destination. This may seem obvious, but the perception of a carrier will be diminished if the carrier's range of service destinations is poor compared to other competitors.

Diversity:

Assuming that service from more than one carrier is available, the next most important factor is carrier and route diversity. In general, customers do not wish to 'lock' themselves into one carrier when they can have a choice.

Cost:

Quality of service is tied closely to price. When it came to a decision to select two offerings, the more expensive offering with the perceived higher quality of service was preferred to the less expensive with the lower quality.

Continuity/Inertia:

A reason for remaining with a particular carrier was the fact that they had used a particular carrier for some years, and were generally satisfied with that carrier's performance.

Familiarity:

Many companies value the knowledge built up in the carrier of the customer's Network. They value discussing their telecommunications requirements with a carrier representative who is familiar not only with the company's network and business, but who is familiar with their internal politics and the purchasing procedure.

Image:

Buyers of International telecommunications services are mostly professionals who satisfy themselves that carriers can live up to their image before selecting a carrier or carriers.

Exhibit - 2

Quality Of Service VariablesCircuit Availability :

The yardstick against which users measure quality of service is circuit availability. Unplanned outages cause serious operational problems within customers' organizations. The effect of such outages depend on the importance of the traffic over the link. High speed applications were more important than low-speed data transmissions.

Circuit Provisioning :

A carrier's service quality was not measured by shortest delivery time, but the timely delivery of working circuits as promised.

Fault Management :

When circuits go down, the telecommunications manager is under considerable pressure from his users to provide answers. Telecommunication users want accurate information about the cause and location of the fault and the time needed to restore it.

Provisioning Management :

When 'ready for service' dates are going to be missed, customers value early notice, honest reasons for the delay and a final, achievable date.

Quality of Carrier's Staff :

Telecommunications Managers look for technical competence, good feedback, a helpful attitude and a willingness to make special arrangements. Customers value cheerful, attentive, dedicated staff who are proud to belong to their company.

Transmission Performance :

Digital International leased circuits are believed to deliver similar bit error rates, irrespective of the carrier.

APPENDIX - E

التقديرات المتوسطة لسكان دول المجلس (بالآلف)
ومتوسط معدل النمو السنوي (%) (١٩٥٠ - ٢٠٠٠)

Medium Projections for GCC States Population (in Thousand)
& Average Annual Growth Rate (%) (1950 - 2000)

السنة	الدولة											
	الكويت Kuwait		قطر Qatar		سلطنة عمان Sultanate of Oman		المملكة العربية السعودية Kingdom of Saudi Arabia		البحرين Bahrain		الإمارات العربية المتحدة United Arab Emirates	
	معدل النمو السنوي (%) Annual Growth	العدد No.	معدل النمو السنوي (%) Annual Growth	العدد No.	معدل النمو السنوي (%) Annual Growth	العدد No.	معدل النمو السنوي (%) Annual Growth	العدد No.	معدل النمو السنوي (%) Annual Growth	العدد No.	معدل النمو السنوي (%) Annual Growth	العدد No.
1950	5.37	152	6.73	25	1.94	413	2.31	3,201	2.91	116	2.51	70
1955	6.67	199	5.03	35	2.08	455	2.51	3,593	3.10	134	2.69	79
1960	10.53	278	8.84	45	2.46	505	3.25	4,075	4.04	156	9.38	90
1965	9.17	471	9.28	70	2.71	571	4.66	4,793	2.78	191	8.70	144
1970	6.04	744	8.60	111	3.16	654	5.13	5,745	4.28	220	16.35	223
1975	6.24	1,007	5.84	171	5.01	766	4.26	7,251	4.88	272	13.97	505
1980	4.36	1,375	5.29	229	4.67	984	3.96	9,372	3.65	347	5.69	1,015
1985	4.02	1,710	4.15	239	3.34	1,242	3.83	11,595	3.07	430	3.26	1,350
1990	3.08	2,090	3.41	367	3.34	1,468	3.79	14,131	2.24	515	2.24	1,588
1995	2.64	2,438	2.69	436	3.40	1,735	3.79	17,118	1.87	601	1.87	1,776
2000		2,782		499		2,057		20,686		682		1,950

Source:
World Population Prospects 1988
United Nations - New York, 1989.

المصدر:
سكان العالم واتجاهاته ١٩٨٨
الأمم المتحدة - نيويورك ١٩٨٩

GLOSSARY

AT&T	: American Telephone & Telegraph Company
BATELCO	: Barhain Telecommunications Company
BT	: British Telecom
CCITT	: International Telegraph and Telephone Consultive Committee
CPA	: Customer Premises Equipments
ETISALAT	: Emirates Telephone Corporation
EXCO	: Executive Committee
FMC	: Facility Management System
FOC	: Fiber Optic Cables
GCC	: Gulf Cooperation Council
GDP	: Gross Domestic Product
GPO	: General Post Office
GTO	: General Telecommunication Organization
IAL	: International Areadio Ltd
IDAS	: International Database Access Services
ISDN	: Integrated Services Digital Network
ITU	: International Communication Union
LC	: Leased Circuits
LAR	: Least Absolute Residual
MATS	: Mobile Automatic Telephone System

MSM	: Message Switching System
MTS	: Message Toll Services
NTT	: Nippon Telegraph & Telephone Company
OLS	: Ordinary Least Square
PABX	: Private Automatic Branch Exchange
PSTN	: Public Switch Telephone Network
PTO	: Public Telephone Operator
PTT	: Post, Telegraph & Telephone
Q. TEL	: Qatar Public Telecommunication Cooperation
TEP	: Telephone Expansion Project
UAE	: United Arab Emirates
UN	: United Nations
WATS	: Wide Area Telephone Services

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