GUIDELINES FOR ATTRACTING PRIVATE CAPITAL TO CORPS OF ENGINEERS PROJECTS

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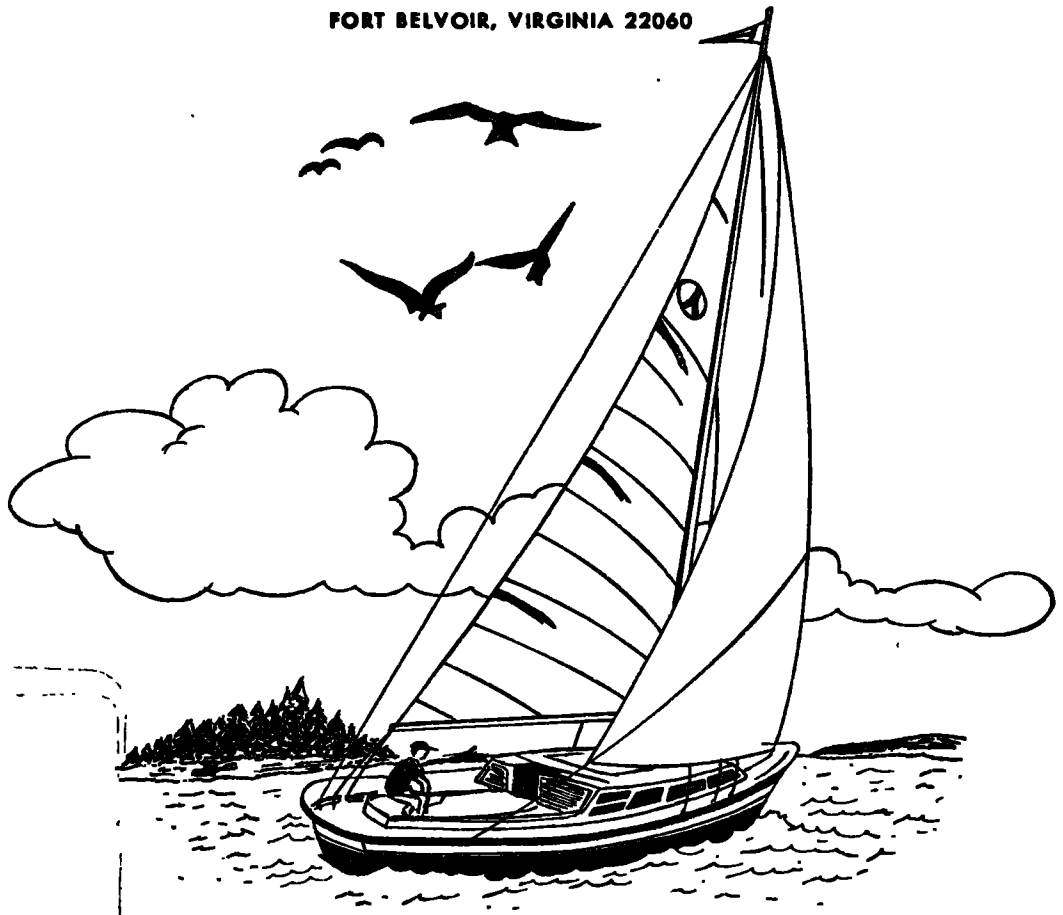

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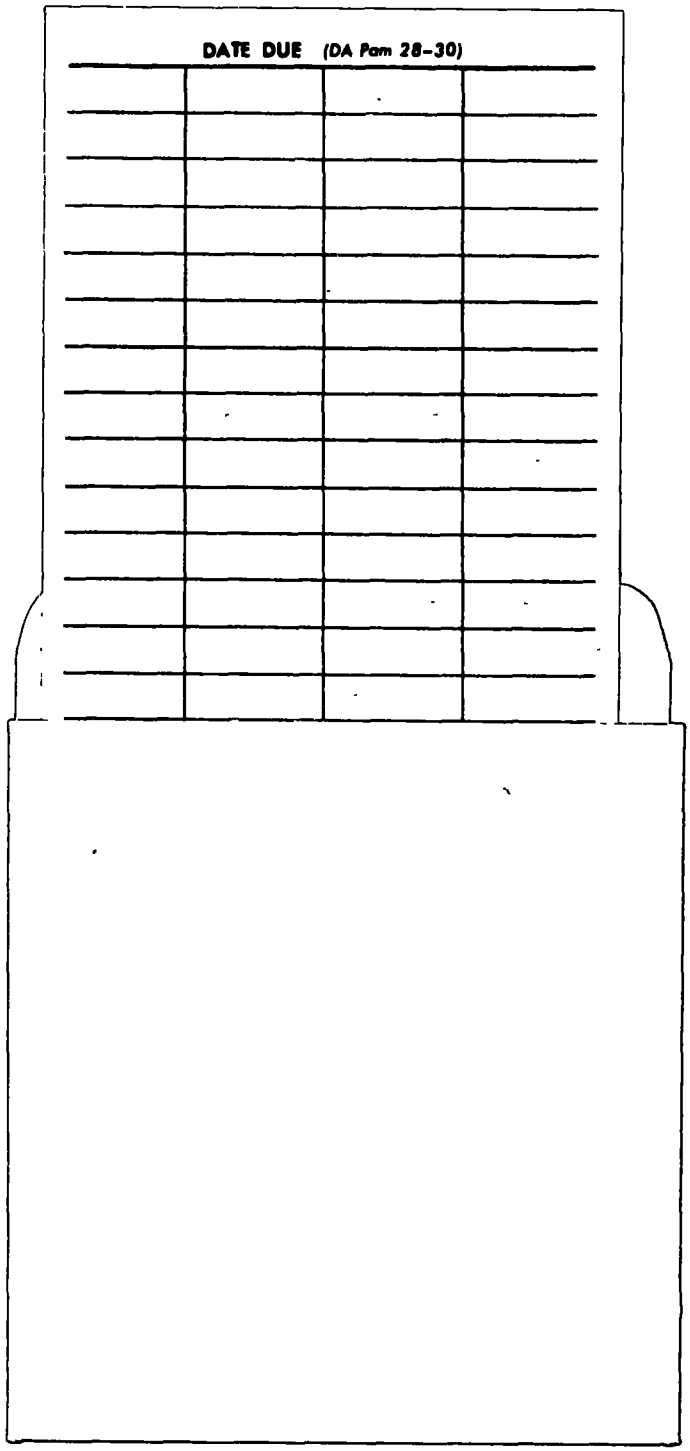
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A Report Submitted to the

U.S. Army Engineer Institute for Water Resources
Kingman Building
Fort Belvoir, Virginia 22060

by

Bureau of Business Research
West Virginia University
Morgantown, West Virginia 26506

Under Contract Number DACW31-75-C-0077

Volume I Prepared by:

G. Richard Dreese
Professor of Economics

and

Tom S. Witt
Associate Professor of Economics

Volume II Prepared by:

James M. Rovelstad
Professor of Marketing

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FOREWORD

This report reflects a study of concessionary operations at several Corps lakes located across the United States. The essential problem was to discern the policy and procedural means by which additional private capital could be attracted to meet the needs of nearly 400 million visitors who use recreation facilities at Corps projects.

The researchers found that Corps concessionaires are small businesses and suffer the problems of all small business, particularly with respect to management inexperience. They found no single factor which influences profitability. The report conclusions dispute many of the commonly held assumptions about the factors critical to profitability.

Corps managers should carefully consider the recommendations. Standardization of accounting procedures and periodic audits to maintain quality control of financial information provided by the concessionaires is clearly indicated. Developing training and other management improvement programs for concessionaire operators, probably through the Small Business Administration appears warranted. If additional capital inflows from private sources are to be encouraged, controls and other inhibition on pricing of concessionary services and competitive services supplied by the Corps should be relaxed. Corps sponsored market studies for individual concessionaire sites appear to offer limited assistance to finding and assuring profitable concessionaire operators.

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This report reflects a study of concessionary operations at several Corps lakes located across the United States. The essential problem was to discern the policy and procedural means by which additional private capital could be attracted to meet the needs of nearly 400 million visitors who use recreation facilities at Corps projects.

The researchers found that Corps concessionaires are small businesses and suffer the problems of all small business, particularly with respect to management inexperience. They found no single factor which influences profitability. The report conclusions dispute many of the commonly held assumptions about the factors critical to profitability.

PREFACE

This study presents an analysis of Corps of Engineers commercial concessionaires located on Corps projects throughout the United States. The study consists of two volumes, the first being devoted to the development and estimation of a statistical model of "concessionaires." The second volume is a feasibility study for a marina and lodge complex at the newly-developed Raystown Project near Huntingdon, Pennsylvania. As part of the study, a forecast was made of the Raystown project using the model developed in Volume I.

Many persons contributed to this study, some more extensively than others. We specifically want to thank all of the persons in the Bureau of Business Research of West Virginia University including Dr. Dennis R. Leyden, Director; Mr. Stanley J. Kloc, Research Associate; and secretaries, Pat Gurtis, Nancy Ireland, Deanna Jefferson, Dawn Poole, Brenda Jones, and Linda Hastings.

We appreciate the fine effort of the graduate assistants on the study: Sue Mattson, Jon Pees, and Chin Yang. The West Virginia University Computer Center provided many hours of expert consulting to the project as well as free time for some of the analysis. Ms. Linnea Hazen of the U.S. Department of Commerce, Regional Economic Information System Branch also deserves our thanks.

Finally, we want to thank the many Corps of Engineers officials in the Office of the Chief of Engineers and in District Offices who provided data, insights, and many hours of their time to this project. And we especially want to thank the concessionaire owners and managers, including those we visited and those we interviewed by telephone. There was not one instance throughout the study in which we lacked cooperation from either Corps officials or concessionaire owners.

The cooperation and patience of Mr. Robert W. Harrison, Director of the Center for Economic Studies of the Institute for Water Resources, and Mr. L. George Antle, Economist for the Institute, are greatly appreciated. The cooperation of Mr. Howard Kass of the Baltimore District is similarly appreciated.

G. Richard Dreese
Project Director

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G. Richard Dreese
Professor of Economics

and

Tom S. Witt
Associate Professor of Economics

CHAPTER 1

CONCLUSIONS AND RECOMMENDATIONS

This study attempted to determine the primary reasons for the profitable and unprofitable operations of 94 commercial concessionaires located at 32 Corps projects throughout 7 representative Corps districts in the United States. The number of concessionaires in the sample was chosen on the basis of a number of criteria, foremost of which was the availability of both income and balance sheets for the year 1973. Associated with these concessionaires were project and market data for the year 1973. While many projects of the Corps were excluded from the sample and subsequent analysis because of insufficient data on concessionaire performance, the sample utilized is judged to be representative of all Corps projects. Consequently, it is felt that the specific conclusions drawn from this study can be generally applied to all Corps projects.

The sample data were used in a cross section analysis of the concessionaire profitability. In developing the statistical analysis, extensive use was made of both economic theory and information obtained from telephone and on-site interviews. Based upon this analysis, the following conclusions regarding the successful or unsuccessful operations of concessionaires at Corps projects during 1973 have been formulated.

Conclusions

1. Commercial concessionaires at Corps projects are smaller on average than those operating on National Park Service lands. Moreover, 82 per cent of Corps concessionaires had annual sales of less than $200,000 in 1973 and 78 per cent had less than $200,000 in assets in 1973. Corps concessionaires are by most definitions small businesses and suffer the many problems of all small businesses, particularly those associated with management inexperience.

2. Many factors influence the operations of concessionaires, and, consequently, affect the firm's profitability. There is no single most important cause for the successful operation of the concessionaire, based upon this analysis.

3. The market factors that presumably are important determinants of the successful operations of concessionaires were consistently of very minor importance in the analysis. Such market factors include personal income, per capita income, number of households, retail buying power, income distributions, and boat registrations, among others.

Each project appears to serve a particular market which is unique and difficult to delineate. Although the analysis defined the standard market area in terms of a 50-mile radius surrounding the project, it is recognized that this factor may either overestimate or underestimate the market size for a particular project. There was justification for this delineation on the basis of previous Corps studies, other studies, and from concessionaire and district official interviews.

This conclusion in no way implies that market factors are not important to concessionaires at Corps projects, since a lack of demand for the services of the concessionaires is equivalent to zero sales and zero profits. Yet, the market factors were not statistically significant in explaining why some concessionaires were profitable and some were unprofitable in 1973. In essence, the study centered on the question: Given a demand for its services, why are some concessionaires profitable and some unprofitable? The study does not attempt to explain market demand for the concessionaires.

4. Those factors which were significantly related to the firm's profitability revolve around what has been defined as project variables and management variables. The important project variables include the shoreline of the project, the purpose for which the project was established, the availability of nearby housing facilities, the availability of rental boats, the year in which the project was started, and the number of boat launch ramps available. The important management variables include the legal status of the firm, its

debt and expense management, and its ability to keep expenses under control. It should be noted that the concessionaires with the largest sales or assets were not as a rule among the most successful firms. Profitible management of concessions has little to do with size per se.

5. The evidence in the study concerning the effects of climatic conditions and/or water fluctuations is mixed. Interviews with concessionaires indicated this was the most important factor affecting the successful operation of the firm. The analysis of the effects of water variability on a concessionaire's profitability showed little significant impact. However, there is some evidence that the impact is more on a firm's gross revenues and the level of visitations to the project rather than on its sales. A definitive study of these effects would entail a time series analysis of concessionaires and water fluctuations.

6. It is difficult to make strong conclusions regarding the existence of economies of scale in the concession operations. By definition, economies of scale would be indicated by declining average variable costs as the firm's output increases. While most concessionaires have a variety of outputs, the number of boat slips reported was used in measuring economies of scale. Although the largest firms were consistently not the most profitable or most efficient, there does appear to be a minimum scale of operation associated with profitable operations. The average number of boat slips associated with profitable concessionaires was about 131 in 1973. Since no other measures of output were available for a large number of firms in the sample, it was not possible to estimate or measure other scale economies. Some minimal evidence was generated suggesting that average cost declines when the number of boat spaces available expands but this evidence is inconclusive and somewhat unreliable at this time.

7. Although a few concessionaires were critical of the rental fees on boat sales charged by the Corps, most believed that the overall leasing arrangement was fair and that the rents charged by the Corps were fair relative to the market value of the leases. Those who were convinced that the rents were too high typically

had no prior business experience and, hence, had no familiarity with existing market rents. There appeared to be some resentment among concessionaires that the Corps regulates them too closely, but these did not represent a majority opinion. In several instances, Corps district officials indicated that a number of projects had too many small concessionaires to assure successful operations and that a desirable policy might entail the consolidation of the concessions. These same officials, having recognized this problem, are currently proceeding cautiously in the development of concessions and associated recreation areas on new Corps projects.

8. While the regression model developed in this study has many limitations, it can be used by various Corps districts for preliminary screening or forecasting purposes when new recreation facilities are planned. With carefully controlled assumptions the model can provide a rough forecast of the potential profitability of a planned facility. The nature of the aggregation used in its estimation makes it of limited value for site-specific planning purposes. Nevertheless, if employed properly it can be quite useful to Corps planners in the future.

Recommendations

The recommendations below are derived from the conclusions of the statistical analysis and from knowledge gained during the course of the study. The latter is based upon information gathered in assembling the financial data of the firms; from interviewing concessionaires and Corps officials, and from reviewing similar studies by the Corps and other governmental agencies.

1. With regard to advertising and reviewing proposals for new concessionaires, Corps districts should continue to place heavy emphasis on the financial and management background and skills of the prospective concessionaire. These factors, though hard to evaluate on any precise scale, are very important to the successful operation of the concessions. Due to the general focus of this study and the unavailability of data, specific guidelines on management expertise were not developed. Further research is needed which specifically examines the management characteristics of successful concessionaires.

2. The nature of the project and the available services at the project should also be evaluated carefully since the project factors which are under the direct control of the Corps apparently have much to do with attracting visitors to the projects and subsequently providing concessionaires with potential sales and profits. Such factors as the convenient location of and access to marinas, the provision of nearby campsites or lodging facilities, and of adequate boat launches, and related features are important in attracting visitors.

3. While market studies have been recommended strongly by various Corps districts (for example, the evaluation procedures developed by the St. Louis District and the Ohio River Division) as being essential in preparing bid proposals, it is our judgment that such market studies would be more useful if applied to an analysis of the total project market, and that little precise information can be gathered from market analyses for individual concessions if these are to be used in projecting the success or failure of an individual concession site. It is difficult to estimate the market share that a particular concessionaire will achieve. It is also difficult to estimate this market share over time using standard market variables such as population, income, household numbers, buying income, etc. Because of these problems, there has arisen some pessimism concerning the cost effectiveness of individual concession market studies, particularly in light of the absence of a standardized methodology for the studies and the absence of follow-up evaluations of the actual concession operations relative to market and success predictions.

4. While no measure of highway accessability was available for this analysis, personal conversations with many concessionaires have revealed that the location of concession facilities on or near major traffic arteries was very important in determining the success of the concession. Most of the concessionaires who felt their location was not ideal felt as they did because of inaccessibility from major traffic or because of wind and water exposure.

5. One of the most consistent influences on profitable operations which showed up in the statistical analysis was the legal form of the concessionaire. As a rule, corporate ownership was negatively associated with profitable operations. This finding may be due to the fact that in partnerships and proprietorships the owners are likely to be the managers and, thus, are in contact with the firm's operation on a day-to-day basis. On the other hand, corporate ownership could mean absentee ownership and, thus, reflect an inability to monitor and control management decisions on a regular basis. In fact, one of the largest concessionaires in the sample was corporately controlled, and, as mentioned in private conversation, its principal problem was obtaining adequate management. In light of these findings, it is recommended that the Corps consider carefully the proposed legal status of the firm when reviewing bid proposals.

6. Based on this analysis, it was found that profitable concessionaires made better use of their assets than unprofitable ones. In part this was due to the presence of many assets which are not generating sales or rental income for the concessionaires. Typically, the Corps requires prospective recreation area concessionaires to provide expensive, but non-revenue producing assets, such as parking lots, sewage systems, roads, etc. We recommend that all or most of the major "overhead" capital be provided by the Corps or that the concessionaire be allowed to have more flexibility in charging fees for the use of these hitherto free goods. This practice is, of course, being implemented in some districts, and is presently within the discretion of the individual district.

7. A number of concessionaires noted that standard fees are charged at recreation areas on the same project and that frequently the quality and quantity of services available at these areas varied considerably over the project. It is recommended that the Corps experiment with greater flexibility in pricing at projects. Such a policy would provide more incentive to concessionaires to "compete" for customers.

8. Some accounting standardization would be helpful in evaluating the financial statements submitted by concessionaires. One of the most difficult parts of this study entailed the translation of basic financial information from the income and balance sheets to the standard forms used in the analysis. In many cases, sizable errors were discovered on the unaudited financial statements and, as was mentioned in Chapter 5, this required recalculation of the profitability of many firms. It is recommended that all Corps districts employ a standard reporting form so that comparative studies of future concessionaire performance can be adequately performed. These requirements can be included in the list of proposal specifications which the Corps circulates prior to receiving bids for proposed concessions.

9. Since the Corps appears to be especially concerned about the operations of commercial concessionaires, it is further recommended that a comprehensive evaluation system be established which would be charged with the evaluation of market studies and follow-up evaluations of concessionaire performance in light of previously executed market analyses.

10. There is no way to guarantee a rate of return to concessionaires. To the degree that the Corps agrees to guarantee a rate of return (as is done with publicly-regulated electric utilities) the Corps must subsidize parts of the operations of concessionaires. To the degree that the Corps wants to move away from subsidizing or guaranteeing the profits of concessionaires it must allow competitive forces to determine which concessionaires operate at its projects. The Corps cannot attempt to control prices and other aspects of concessionaire operations and expect capital to freely flow into these projects. The long and poor record of most concessionaires at Corps projects suggests that these operations will continue to have difficulties and that capital will continue to be scarce with regard to investment in Corps projects.

CHAPTER 2

INTRODUCTION AND BACKGROUND

Introduction

This report was completed under contract number DACW31-C-0077, the primary purposes of which included:

1. The examination of Corps of Engineers commercial concessionaires in order to develop guidelines on the profitable operation of these concessionaires for the planning of the Corps;

2. The development of recommendations for use by District planning and real estate management personnel to enable individual Corps Districts to attract capable concessionaires and retain them on their water projects;

3. Application of the results of this study to the proposed Raystown Lake project in Pennsylvania to determine the feasibility of using the model developed in this study for decision making at the project level.

From a review of the above purposes, it should be obvious that this study confronts a series of complex questions relating to the management of small businesses. While this portion of the recreation industry has growth potential it remains vulnerable to cyclical fluctuations in the economy and, more recently, to the effects of the energy crisis on transportation patterns.[1] This study involves market

[1] The nature of the recreation industry has been variously studied under its own name as well as under a variety of other industry titles such as the tourism or travel industry. However, illustrative of the cyclical nature of the boating industry which is a subpart of the recreation industry, is the decline in boat sales in 1975 which is estimated to be 25 per cent below 1974 levels. This may be due to higher boat prices, which are estimated to have risen by 15 per cent in 1975 or to the gasoline price rises, or a combination of both. This information was provided by an official of a major boating association who wishes to remain anonymous.

analysis, since each concessionaire in the sample chosen for study serves a relatively distinct market area with diverse climatic, seasonal and socioeconomic characteristics.

Throughout this examination of the experiences of many different concessionaires in selected Corps Districts three assumptions were made. First, it was assumed that regular and predictable patterns of firm

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There is no attempt made in this study to review the vast literature on the recreation industry or the tourism-travel industry. Such a review has been thoroughly completed by the U.S. Army Institute for Water Resources in its report, The Economics of Water-Based Outdoor Recreation: A Survey and Critique of Recent Developments, Robert J. Kalter, March, 1971. Other analyses have been completed and various projections of the potential growth of this industry have been made with reference to regional growth potential. A few studies that are relevant to this project are briefly reviewed later, but for a more general discussion of the various parts of the segmented recreation industry the reader is referred to the following studies: Recreation as an Industry, Robert Nathan Associates, Inc., Report of the Appalachian Regional Commission, 1966; A Strategy for Developing the Leisure Industry in the Ozarks Region, Midwest Research Institute, Report to the Ozarks Regional Commission, 1968; Recreational Potential in the Appalachian Highlands: A Market Analysis, URS Research Company, Report to the Appalachian Regional Commission, 1971; U.S. Congress, House Subcommittee on Environmental Problems Affecting Small Business of the Permanent Select Committee on Small Business, Small Business Enterprises in Outdoor Recreation and Tourism, 93d Congress, 2d Session, 1974 (this major study was performed by the Office of Planning, Research and Analysis, Industry Studies and Size Standards Group, U.S. Small Business Administration, and hence will be referred to as the SBA Study); James M. Rovelstad, Analytical Measures of Travel and Tourism for States and Smaller Areas, Bureau of Business Research, West Virginia University, July 1974; Procedures for Evaluation of Water and Related Resources Projects, Report of the Special Task Force of the U.S. Water Resources Council, Serial No. 92-20, September 1971.

behavior could be isolated using econometric methods standard in economic analysis. Further, it was assumed that these patterns of behavior, once captured in a well specified econometric model, could be applied in various geographic areas to help determine the potential profitability of typical concessionaires at Corps of Engineers projects. Finally, it was assumed that with this knowledge about the factors that make for successful (profitable) operation of concessionaires, the Corps of Engineers could supplement its existing information and thus better attract private capital onto its water-based recreation areas. In this manner the Corps would be able to serve the dual purpose of providing flood control and recreational benefits to the people located near its water projects.

Background of the Study

As with all governmental agencies, the Corps of Engineers has statutory obligations which it must meet under law. The Corps is charged with the management of all inland navigable waterways and associated public works in the United States. Although recently, this obligation has tended to be broadened into environmental areas, the Corps has more traditionally provided flood control benefits in many areas of the United States. Under the umbrella of additional benefits to be derived from its flood control projects, Corps projects have also provided for a wide variety of recreation activities either through direct provision of facilities or through leasing arrangements with other governmental agencies, private groups and/or individuals.

In recent years it has become increasingly clear that federally financed projects are very carefully screened by Congress and the Office of Management and Budget, reflecting a trend toward economy in public spending. Such close scrutiny suggests that substantially greater benefits relative to costs will be required of federally financed projects than may have been necessary historically. There is no reason why flood control measures provided by the Corps will not need to be carefully justified as well. Furthermore, recent trends in federal finance suggest that federal, state or local government subsidies of all kinds will decrease in the future, and that recreation areas traditionally provided by federal, state or local

governments will increasingly be turned over to private owners or managers.[2]

As an outgrowth of these general moves toward economy in government, the Corps of Engineers was faced with two related areas of concern: (1) measuring or identifying recreational benefits at its existing projects and at new projects; and (2) finding ways to attract private owners and concessionaires onto its water-related projects to reduce its financial involvement in the recreation business. The Corps has not been alone in these concerns since the Park Service and Forest Service are also heavily involved in the recreation business and will presumably need to engage in the same analysis and reappraisal.

A third concern of the Corps has been the criticism that in its attempts to provide flood control protection and navigation benefits, it has not been concerned about the recreational benefits which may be destroyed. Thus, the potential recreational benefits from Corps projects continue to be an important area for Corps planning as well.

The information derived from this study is intended to be used to encourage the flow of private capital into Corps concessionaires, with some known probability of success provided by Corps planners. It is hoped that by using this study, the Corps will be able to avoid the traditional difficulty it has had in attracting private capital to its projects. An example of this difficulty is well summarized in

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[2]The intent of Congress is specified in Public Law 91-611, The River and Harbor and Flood Control Act of 1970 which contains the following requirements:

> "Sec. 209. It is the intent of Congress that the objectives of enhancing regional economic development, the quality of the total environment, including its protection and improvement, the well-being of the people of the United States, and the national economic development are the objectives to be included in Federally financed water resource projects, and in the evaluation of benefits and costs attributable thereto, giving due consideration to the most feasible alternative means of accomplishing these objectives."

recent study of the St. Louis District which concluded that having received so few proposals from potential concessionaires at one of its projects that it "has resulted in forced selection of a concessionaire to fulfill the public need for watercraft-oriented services and facilities."[3]

The Commercial Concessionaire on Governmental Projects

As noted earlier, it is not our intention to review the literature on the recreation industry except where it touches on the future of small, water-based recreation firms. Since this study isolates concessionaires at Corps projects as the focal point of the analysis, there is little need to forecast trends in aggregate United States recreation demand. And while the problems of the small business have been widely studied for a number of years, only recently have concessionaires at the Government recreation areas been studied by the Small Business Administration for the Permanent Select Committee on Small Business.[4] We will therefore briefly review some of the pertinent findings of the SBA study and others completed specifically for the Corps that relate to the objectives of our study.

In the Small Business Administration's recent and thorough study titled Small Business Enterprises in Outdoor Recreation and Tourism, the objective was to "bring together for the first time, into one report, all the relevant information currently

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[3] Guidelines for Developing Commercial Marina Concessionaires, U.S. Army Corps of Engineers, Water Resource Developments, St. Louis District, 1974, p. 3.

[4] U.S., Congress, House, Subcommittee on Environmental Problems Affecting Small Business of the Permanent Select Committee on Small Business, Small Business Enterprises in Outdoor Recreation and Tourism, 93d Cong., 2d Sess., 1974.

available on small suppliers of goods and services in outdoor recreation and tourism and to present a cohesive and meaningful analysis of the financial conditions and other problems of smaller firms in this industry."[5]

While there are many government departments which manage recreation areas in the U.S., the SBA study centered on the number of concessionaires under control of the Park Service, Forest Service and Corps of Engineers, as indicated in Table 2.1. In fact, a sub-objective of this study was to "determine the profitability performance of federally administered concessions....and how they relate to firms not in recreation and tourism businesses but in similar lines of economic activity."[6] This is also one of the major objectives of our study.

After extensive analysis, the SBA study concluded that:

> "Although opportunities are available to small firms in outdoor recreation and tourism, a high proportion of small firms are operating at a loss (about 20 to 30 per cent based on its study) and many of those that are profitable have lower profit margins and lower returns than small firms in similar kinds of activities. The difficulties of small firms in this industry are due to basic conditions, some of which are more peculiar to outdoor recreation and tourism than to other industries. Seasonality, unfavorable weather, management deficiencies, and environmental and antipollution pressures have placed heavy burdens on small firms and have restricted their ability to operate successfully. Also, the current energy shortage situation along with the higher gasoline prices is a more recent problem facing small businesses."[7]

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[5] Ibid., p. 7.

[6] Ibid., p. 27.

[7] Ibid., p. 10.

TABLE 2.1

NUMBER OF CONCESSIONS AND GROSS SALES BY FEDERAL AGENCY

Agency	Number of Concessionaires	Gross Sales (Millions)	No. in SBA Study	Per Cent of Total Concessionaires in SBA Study
Forest Service (1972)	1,823	$80.0	91	5
Corps of Engineers (1970)	406	3.9*	62	15
Park Service (1971)	244	93.0	157	64

Source: U.S., Congress, Subcommittee on Environmental Problems Affecting Small Business of the Permanent Select Committee on Small Business, Small Business Enterprises in Outdoor Recreation and Tourism, 93d Cong., 2d Sess., 1974, p. 26.

*Based upon 62 firms in 1969.

Beyond these general conclusions, the SBA Study found that concessionaire owners and managers put profits as a secondary objective and the "glamour of the outdoors in a recreation-oriented business located away from the pressures created by population centers" as a primary objective.[8] A second conclusion emphasized the importance of good management above all other characteristics at successful concessionaire operations. In the words of the SBA study: ". . . the crucial long-run measure of success is good management, in which the owner/manager has an intimate contact with his day-to-day business activities, has established cost control procedures, maintains good records, and makes sound decisions quickly."[9]

[8] Ibid., p. 29.

[9] Ibid., p. 35.

In a recent study of the concessionaires in the St. Louis District, guidelines were developed for attracting concessionaires to Corps projects. This study concluded that most Corps concessionaires were marinas (about 67 per cent) and that "a standard procedure for assessing the market relative to these developments should be adopted."[10] The specific recommendations for achieving this objective are listed as follows, along with many of the details associated with the kind of analysis that concessionaire managers or potential managers should be required to submit to Corps offices:

1. Contained within the report is a recommended procedure to be used as a guide in accomplishing a market study and analysis for commercial marina concession development.

2. It is recommended that the invitation for Proposals be expanded to include a feasibility or pro forma statement to evidence that the concessionaire has determined the marketability of the concession envisioned and has estimated the potential cash flow and return on the investment.

3. Any subsequent development and requests to the Corps for same should be supported through evidence provided by the concessionaire that a need actually exists for additional development at a particular location.

4. Based upon the sensitivity and cash flow analysis, the minimum initial required scale of development as presented in the Invitation for Proposals should be increased from the existing 35 rental slips to 70 rental slips assuming the market study and analysis supports this scale of development.

5. The existing required mix of facilities and services should remain basically the same as detailed in the Invitation for Proposals with the addition of boat and motor repair service.

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[10] Guidelines for Developing Commercial Marina Concessionaires, op. cit., p. 6.

6. Develop a standard system of accounting records and reports for commercial concessions.

7. Expand the cash flow and minimum scale of development analysis to determine what is considered adequate in terms of working capital on an initial basis and on a seasonal basis.

8. Develop architectural controls and design criteria to guide the physical development of commercial marina concessions.

9. Develop design criteria and specific considerations to be utilized in site selection, harbor excavation and harbor protection.[11]

In a second study, the St. Louis District analyzed the concessionaires at its Carlyle Lake project to see what could be done to improve their operations.[12] This involved a market analysis as well as analysis of the physical problems associated with the Carlyle project. It is interesting to note that after admitting to underperformance in terms of potential market penetration, this study concluded that "the facilities at Carlyle Lake have endured excessive physical impediments to successful operation."[13] This conclusion is important with respect to other Corps projects since the purpose of many Corps projects is to serve the flood control needs of the area, rather than the recreational needs of nearby citizens. The two objectives are possibly in conflict at many Corps projects. However, because of the potential serious nature of physical impediments to the successful operation of concessions at Corps projects, additional information was sought in our study on this problem. This is particularly important since another Corps study done for the Tulsa District on the impact of the Tenkiller Ferry Lake

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[11] Ibid., pp. 6-11.

[12] An Analysis of Commercial Marina Concessions at Carlyle Lake, Environmental Resources Section, U.S. Army Corps of Engineers, St. Louis District.

[13] Ibid., p. 78.

concluded that physical impediments due to lake drawdowns were insignificant problems to both recreationists and boat owners, and that costs to all concession operators were slight. The Tulsa study found that: "It has not yet proved possible to identify any statistical relationship whatsoever between Corps of Engineers' visitation data and lake level." It further notes that: "On-site personal interviews with more than one hundred groups of recreation users indicated little sensitivity to lake level in the decision on whether or not to visit Tenkiller Ferry Lake."[14] As is illustrated, the evidence to date on the impact of physical characteristics on recreation users and on the potential success or failure of marina operators and other concessionaires at Corps projects is quite inconclusive and should, therefore, be an important part of any study on the subject. To the extent possible, such problems were analyzed in this study.

While numerous studies of the recreation business and especially of small firms in this industry have been completed (see the SBA Study for an eight-page listing), the studies cited above are the only recent ones to our knowledge specifically charged with analyzing concessionaire operations at U.S. government-managed recreation areas. Also, although the SBA Study is widely applicable and as thorough as any study recently completed, and the St. Louis Study and several other less recreation-specific types of studies by the Corps are excellent in that they are detailed investigations into very specific Corps projects and concessionaires, certain specific limitations are present in both instances. For instance, the macro approach of the SBA Study does not permit specific recommendations adoptable by the Corps of Engineers for use by its planners in establishing successful commercial concessionaires at Corps projects. In contrast, the specifics of the St. Louis studies are not very useful for developing a general model of profitability applicable to the great variety of concessionaires throughout the many Corps projects in the United States.

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[14] L. Warner, D. D. Badger and G.M. Lage, The Economic Impact of Tenkiller Ferry Lake, Report prepared for the U.S. Army Corps of Engineers, Tulsa District, Research Foundation of Oklahoma State University, August, 1973.

This study, on the other hand, borrows from the approaches of the ones mentioned above and is both aggregative in that it looks at national data and many Corps Districts and projects and disaggregative in that it looks at specific concessionaires at many Corps projects and recreation areas throughout the United States. In this regard, the findings of the study do not contradict the results of other government studies, but simply generalizes them, thereby increasing their applicability to a wide scope of Corps planning activities.

CHAPTER 3

SAMPLE SELECTION AND METHODOLOGY

Introduction

The sample of projects, recreation areas and concessionaires chosen for detailed analysis in the remainder of this study is presented in this chapter. In addition, the chapter includes some of the general characteristics of Corps projects and compares attendance patterns at these with other Federal recreation projects. An extensive discussion of the concessionaires themselves is made in Chapter 4.

An Overview of Federal Recreational Attendance Patterns

In calendar year 1973, the Corps of Engineers operated 407 different water projects throughout its 33 Districts in the United States. These projects include dams, lakes, locks and reservoirs. The Corps project and recreation area data used in subsequent parts of this report are from the Recreation-Resource-Management System (RRMS hereafter) which is the computerized information system containing information on all completed Corps projects having an annual recreation attendance of over 5,000 recreation days.[1] This information is collected annually by project managers who forward it through Corps Districts and Divisions to the Office, Chief of Engineers.

In calendar year 1970, the last year for which comparable data are available, Corps projects attracted more persons than any other federally-managed recreation facilities. In terms of recreation days, attendance at

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[1] Throughout this study attendance refers to recreation days. A recreation day is defined by the Corps as "a standard unit of use consisting of a visit by one individual to a recreation development or area for recreation purposes during any reasonable portion or all of a 24 hour period." This definition is in accordance with Supplement No. 1, U.S. Senate Document 97, 87th Congress, 2nd Session.

Corps facilities amounted to 276 million, while attendance at the Park Service and Forest Service amounted to 172 and 173 million, respectively.[2]

Moreover, the reported attendance at Corps projects for recent years has increased from 276 million recreation days in 1970, 310 million in 1971, 328 million in 1972, to 339 million in 1973. In part, the increase in attendance is associated with the opening of new Corps projects with recreational facilities either managed by the Corps or by some non-Corps groups such as state or local governments or private groups or individuals. Part of the increased attendance can also be explained by the growth in the demand for recreation during this period.

Selection of the Corps Districts

The number of projects included within each District of the Corps was determined from an examination of the data included in RRMS. Locks and dams on navigable rivers were not examined in this study (unless they were associated with a reservoir) since the nature of these projects differs considerably from on-land projects and they are less carefully controlled in terms of attendance, among other things. Furthermore, RRMS provided information on the number of concessionaires and recreation areas associated with each project. Recreation areas and concessionaires are used interchangeably in this chapter although they are not in effect the same.[3] The districts chosen for this study are identified in Table 3.1.

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[2] An Analysis of Commercial Marina Concessions at Carlyle Lake, Environmental Resources Section, U.S. Army Corps of Engineers, St. Louis District, p. 6.

[3] RRMS data are collected for each specific recreation area of a project and a concessionaire contracts to operate at a specific recreation area. Usually one concessionaire operates at each recreation area.

They were selected because they contained the largest numbers of concessionaires[4] which provided usable data to the authors.

TABLE 3.1

CORPS DISTRICTS AND RECREATION AREAS IN STUDY SAMPLE, 1973

District	Total Number of Reporting Concession-aires (1)	Concession-aires in Final Sample of Study (2)	Per Cent of Reporting Concession-aires (3)
Fort Worth	28	20	71.4
Little Rock	55	27	49.1
Nashville	53	32	60.4
Omaha	11	4	36.0
Pittsburgh	8	2	25.0
St. Louis	5	3	60.0
Tulsa	57	6	10.5
Total	217	94	43.3
All Corps Districts	312	94	30.1

Source: RRMS, 1973, D-19-A.

[4]The sample of projects, recreation areas and concessionaires used in this study was entirely determined by the usefulness of concessionaire financial reports. Although it is recognized that the sample is probably biased because of the nature of the selection process employed, the degree of bias cannot be ascertained since practically nothing is known about those concessionaires which failed to report their 1973 financial statements or which provided inadequate statements.

The original number of districts selected for study also included Huntington (7 recreation areas) and Sacramento (11 recreation areas). These two districts either chose not to be included in the statistical analysis of the study or submitted information too late for inclusion in the analysis. They were, however, included in the telephone and personal survey part of the study which is discussed later in the report. With the inclusion of both Huntington and Sacramento, the 9 districts chosen for study include 75 per cent of all recreation areas managed by the Corps in 1973 for which data had been reported in 1973.[5] These sample districts reported 52 per cent of the total visitations at Corps projects in fiscal year 1973, as shown in Table 3.2.

TABLE 3.2

SAMPLE DISTRICTS AND ATTENDANCE IN 1973

Districts	Total District Recreation Days in 1973 (Thousands)	Per Cent of Corps Total Visitations
Fort Worth	29,124	8.6
Huntington*	19,282	5.7
Little Rock	25,913	7.6
Nashville	26,392	7.8
Omaha	10,403	3.1
Pittsburgh	12,371	3.7
Sacramento*	3,013	1.0
St. Louis	8,477	2.4
Tulsa	41,791	12.3
Total	176,766	52.1
All Corps Districts	339,098	100.0

Source: RRMS, 1973, O-1.

*Not included in statistical analysis, but covered in telephone survey.

[5] In fiscal year 1973, data for 2,718 recreation areas were reported to the Corps. Of these, 1,911 were managed by the Corps and 807 were managed by non-Corps groups.

The largest proportion of the Districts chosen for the study are in the South, giving rise to the possibility that the resulting sample of recreation areas may be biased. It is interesting to note, however, that the greatest portion of visitations to Corps projects occurs in the May-September months regardless of location. In 1973, about 67 per cent of all visitations to all Corps projects occurred between May and September, while 46 per cent occurred between June and August.

Selection of the Recreation Areas and Concessionaires

Given the above districts, the selection of recreation areas and concessionaires was based on the amount of information available from each district. The total number of recreation areas reported in all Corps districts in RRMS was 312 and it was this population of 312 reporting recreation areas that served as the basis for our sample selection. The total number of reporting recreation areas in RRMS for the 7 districts was 217 so that, potentially, the percentage of recreation areas which could have been in the sample was as high as 75 per cent of all recreation areas (see Table 3.1). The actual number of concessionaires in the final part of the analysis was 94. Further discussion of concessionaire characteristics is deferred to Chapter 4.

Market Areas of Projects

In order to adequately assess the potential profitability of a concessionaire the market served by that concessionaire must be known or approximated. Consequently, every project in the study was assumed to serve a market of approximately a 50-mile radius. This market delineation is supported by several tourism studies including the recently completed study for West Virginia[6] and by survey evidence from the St.

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[6]James M. Rovelstad, Analytical Measures of Travel and Tourism for States and Smaller Areas, Bureau of Business Research, West Virginia University, Morgantown, 1974, p. 3.

Louis study. In the latter study, approximately 90 per cent of boat and slip rentals were made by persons living within 50 miles of the project.[7] Moreover, in our study the nearness of major population centers is introduced into each project's market in order to capture the probable impact of these major population concentrations. Population figures for SMSA's within 50 miles of each Corps project are regularly collected in the RRMS system of the Corps.

After delineation of the 50-mile radius for each project, economic base data were collected on every available important economic data series for the counties falling within the market. As a result of the dispersion of the sample projects, data were subsequently collected for about 450 counties in the United States. As one might suspect, many of the markets in the study are not discreetly separate from nearby markets. Some markets overlap. There is no known method for isolating a "specific" market for any one project. Moreover, much economic research indicates there is no precise way to isolate any market, without extensive and expensive survey work. Where duplication exists, such as in several markets in Oklahoma and Kentucky, judgments were used to try to put counties into their "most likely" market. However, there are a number of projects which share upwards of three counties in their market areas. Delineation of a more "global" market would make sense in these situations, but concessionaires presumably serve a relatively small market and the degree of aggregation of the data is important. It was our intention to disaggregate the data as much as possible.

Having isolated the market area for each project, the data were found to be similar in many respects. Thus, project data and market data are to some extent synonymous. However, much of the project-related data are collected on a regular basis by the Corps of

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[7] Guidelines for Development of Commercial Marina Concessions, Environmental Resources Section, U.S. Army Corps of Engineers, St. Louis District, p. 27. This delineation of a 50-mile market area was confirmed by on-site visits with concessionaires at Corps projects, and is further discussed in the appendix to this report.

Engineers and reported annually in its RRMS reports. Such market and county data as retail sales, per capita income, households and employment characteristics were collected from standard economic sources. A complete list of the items used in the study, by economic area designation (project, recreation area and concessionaire) are contained in Appendix A and are partially listed in Chapters 4 and 5.

Characteristics of 32 Sample Projects

As shown in column 2 of Table 3.3, the projects chosen for study include some of the largest within the Corps system. Of the 20 largest Corps projects in 1973, 12 are included in the study, as indicated by the rankings of column 2 of the table.

It was intended that as many of the major projects as possible would be included in this study. Those actually included are presumably typical. Some indication of their respective size and other characteristics can be observed in the summary data in Table 3.4.[8]

Characteristics of 94 Recreation Areas

Since the recreation data are few as reported annually to the Corps, the differences among these areas will be reflected largely in the concessionaire data, as discussed in Chapter 4. As indicated in Table 3.3, there are 1,911 recreation areas at Corps projects under Corps management. Of these, only 312 reported to the Corps in 1973, and from these the sample for this study was chosen. Few items are reported in RRMS for recreation areas besides acreage data and those items summarized in Table 3.5.

Without more data little can be said about the recreation areas except to indicate that those in the sample are among the largest and most representative

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[8] Also see averages at the bottom of column 1, Table 3.3.

TABLE 3.3

CORPS PROJECTS IN STUDY, RANKED BY ATTENDANCE, AND NUMBER OF SAMPLE RECREATION AREAS FROM EACH

District Project	Recreation Days Attendance (Thousands)	Attendance Rank of All Corps Project	Total Number of Recreation Areas at Project	Total Number of Corps-Managed Recreation Areas at Projects	Number of Recreation Areas in Final Sample
	(1)	(2)	(3)	(4)	(5)
FORT WORTH:					
Bardwell Lake	667	135	7	7	1
Belton Lake	2,272	48	13	13	2
Canyon Lake	1,645	63	12	8	2
Grapevine Lake	3,816	16	12	12	4
Lewisville Dam	2,595	41	21	18	3
Sam Rayburn D & R	2,354	45	19	18	3
Somerville Lake	2,474	44	9	7	1
Stillhouse Hollow Lake	1,134	95	6	6	1
Waco Lake	1,415	76	8	6	1
Whitney Lake	4,199	13	17	16	2
Subtotal	22,571		124	111	20
LITTLE ROCK:					
Beaver Lake	3,227	22	11	11	5
Bull Shoals Lake	3,066	26	21	19	6
Dardanelle Lake & Dam	2,128	51	17	14	1
Greers Ferry Lake	3,411	20	15	14	5
Norfolk Lake	2,984	28	20	20	4
Table Rock Lake	5,755	5	22	20	6
Subtotal	20,571		123	98	27

TABLE 3.3 (Continued)

CORPS PROJECTS IN STUDY, RANKED BY ATTENDANCE, AND NUMBER OF SAMPLE RECREATION AREAS FROM EACH

District Project	Recreation Days Attendance (Thousands)	Attendance Rank of All Corps Project	Total Number of Recreation Areas at Project	Total Number of Corps-Managed Recreation Areas at Projects	Number of Recreation Areas in Final Sample
	(1)	(2)	(3)	(4)	(5)
NASHVILLE:					
Barkley Lake & Dam	4,216	12	44	39	5
Center Hill Lake	3,556	18	21	17	5
Dale Hollow Lake	2,673	36	27	20	10
J. Percy Priest Dam	3,459	19	23	21	4
Wolf Creek Dam (Lake Cumberland)	5,608	6	36	19	8
Subtotal	19,512		151	116	32
OMAHA:					
Fort Peck Lake	693	131	13	9	1
Fort Randall Dam (Lake Francis)	1,542	73	20	20	2
Oahe Dam	2,032	54	40	20	1
Subtotal	4,267		73	49	4
PITTSBURGH:					
Shenango River Lake	876	110	6	4	1
Youghiogheny River	1,146	72	6	5	1
Subtotal	2,022		12	9	2

TABLE 3.3 (Continued)

CORPS PROJECTS IN STUDY, RANKED BY ATTENDANCE, AND NUMBER OF SAMPLE RECREATION AREAS FROM EACH

District Project	Recreation Days Attendance (Thousands)	Attendance Rank of All Corps Project	Total Number of Recreation Areas at Project	Total Number of Corps-Managed Recreation Areas at Projects	Number of Recreation Areas in Final Sample
	(1)	(2)	(3)	(4)	(5)
ST. LOUIS:					
Carlyle Lake	2,532	42	11	6	2
Lake Shelbyville	2,803	33	17	11	1
Subtotal	5,335		28	17	3
TULSA:					
Dension Dam	10,433	2	43	41	1
Eufaula Lake	4,522	10	21	17	1
Fort Gibson	4,008	15	25	22	3
Tenkiller Lake	4,005	14	18	14	1
Subtotal	23,018		107	94	6
Attendance-32 Sample Projects:					
Total	97,304		618	494	94
Average	3,041				
Attendance-All 407 Corps Projects:					
Total	339,098		2,718	1,911	312
Average	833				

Source: RRMS, 1973, selected reports.

TABLE 3.4

SELECTED CHARACTERISTICS OF 32 CORPS PROJECTS IN STUDY, 1973

Item	Mean	Standard Deviation	Lowest	Highest	Coefficient of Variation[a]
	[1]	[2]	[3]	[4]	[5]
Project Attendance [thousand recreation days]	3,242	1,950	667	10,433	60.2%
Recreation Areas	19	11	6	4	54.7
Corps Managed Areas	16	9	4	41	58.1
Per Cent Boating Use	11%	8%	1%	40%	71.7
Weekend Fam. Use in Peak Mo. [days]	24,613	16,411	1,571	65,324	66.7
Land & Water Area [acres]	92,814	130,721	4,365	610,085	140.8
Shoreline-Miles	437	483	25	2,250	110.5
Min. Pool Level-feet	677	414	149	2,160	61.1
Max. Pool Level-feet	741	426	176	2,250	57.5
Ave. Pool Level-feet	714	428	164	2,234	60.0
Nearest SMSA-miles[b]	29	15	0	50	50.8
Pop. of Nearest SMSA[b]	556,549	628,137	57,978	2,352,000	112.9
Households	370	418	17	2,140	113.0
Median Effective Buying Income[c]	$6,587	1,228	$4,526	$ 9,613	18.5
Total Personal Income [millions]	$5,158	$6,687	$ 321	$33,912	129.6

TABLE 3.4 (Continued)

SELECTEO CHARACTERISTICS OF 32 CORPS PROJECTS IN STUOY, 1973

Item	Mean	Standard Oeviation	Lowest	Highest	Coefficient of Variation[a]
	(1)	(2)	(3)	(4)	(5)
Market Pop. (millions)	1,102	1,256	55	6,448	113.9
Per Capita Income	$4,260	$ 720	$2,847	$ 5,824	16.9
Median Per Capita Income	$3,820	$ 784	$2,598	$ 6,052	20.5

[a]Calculated by dividing the standard deviation by the mean.

[b]Only 22 projects provided information on these characteristics, since the SMSAs considered had to be within 50 miles of the project.

[c]Per household.

Source: RRMS--1973; various Oepartment of Commerce data sources; and Sales Management, 1974 Survey of Buying Power, June 1975.

of all Corps recreation areas at the largest and most representative projects. A review of concessionaires chosen for inclusion in the sample completes the data summary. The concessionaire characteristics are reviewed in Chapter 4 in great detail since they are the basis for much of the subsequent analysis.

TABLE 3.5

SELECTED CHARACTERISTICS OF 94 SAMPLE RECREATION AREAS

Item	Mean	Standard Deviation	Highest
Annual Visitations	223,784[a]	200,476[a]	1,048,800[a]
Acreage	200[a]	310[a]	2,463[a]
Boat Spaces	127[b]	98[b]	520[b]
Per Cent Spaces Rented	91[b]	16[b]	100[b]
Boat Spaces Needed	41[c]	62[c]	300[c]
Capital Improvement by Concession in Current Year	$30,403[a]	$30,507[a]	$145,000[a]

Source: RRMS 1973, D-19A.

[a]Based upon 89 of the 94 recreation areas reporting.

[b]Based upon 85 of the 94 recreation areas reporting.

[c]Based upon 86 of the 94 recreation areas reporting.

Analytical Methodology

A variety of relatively standard techniques were used in the study to discover behavioral consistencies incorporated into the final model. A careful review of the project, recreation, and concessionaire data is presented in this and the following chapter. In Chapter 6 a predictive model is developed using multiple regression analysis. The specification of the model follows traditional financial and market analysis. While demand estimation for the services of each concessionaire would be appropriate, no price or quantity data were available for specific markets. Without such data demand functions cannot be estimated.

Discriminant analysis was also used to identify characteristics of profitable concessionaires compared with non-profitable ones. This was the primary characteristic of the sample that was to be explained in the analysis so that probabilities for successful concessionaire operations could be obtained. In this regard, the major dependent variable to be explained with the variety of independent items collected for study and so specified was the profits and/or profit rates of return of concessionaires. The details of discriminant analysis and its use in the study are provided where the technique is used in Chapter 6. The various limitations of the statistical techniques used in the study are similarly discussed where the analysis is presented in Chapter 6.

It was the objective of the study to develop a model of concessionaires operating on Corps projects using whatever data were readily available from primary and secondary sources within a short period of time. The year 1973 was chosen for the cross section analysis since it was the latest year for which most data were available and, as will be shown later, was the most appropriate year in terms of available concessionaire balance sheet and income statement information. To some extent, the tourism business is affected by national economic trends and cycles, and although 1973 was a somewhat unusual year in terms of inflation rates, it was not a recession year as were 1974 and 1975. However, an attempt was made to estimate the impact of national factors on the local markets studied. Data limitations and theoretical limitations necessarily prevented a full-scale regional impact analysis of these national phenomena.

The sample of Corps of Engineers concessionaires used in this study was the largest possible. In fact, were it not for inadequate reports from many concessionaires for the years 1971, 1972, 1973, and 1974, the sample would have approached about 75 per cent of all reporting concessionaires in these years. The amount of concessionaire data available is thus a reflection of the limited number of recreation areas and projects studied. In this case, however, it was judged that considerable increases in time and expense would have been necessary to expand the concessionaire

sample beyond what was achieved, and then probably with only slight improvement in the statistical reliability of the final model. Thus, when the costs of improvement are weighed against expected results, the sample was found to be highly satisfactory for the statistical analysis performed.

Economic Setting of the Study

The basic data on Corps projects, recreation areas, and concessionaires used in the remainder of this study is for the year 1973 only.[9] In order to have a proper perspective for our subsequent analysis this section will review the basic trends in the national economy since 1965 with particular emphasis on business failure rates.

Table 3.6 presents summary U.S. data on real gross national product growth, unemployment rates, and price changes for the period 1965 to 1974. A comparison of 1973 versus these other years leads to the following conclusions. The year 1973 was a year of general prosperity as measured by the above-average growth in real GNP from 1972 compared to the other years. Although 1973 was not a banner year of prosperity as measured by the overall unemployment rate of service workers [which includes persons operating the types of concessions in this study], it certainly was not a period of recession.

An examination of the rate of inflation indicates that 1973 experienced higher than normal rates of inflation as measured by the Consumer Price Index; on the other hand, the inflation rates in the recreational goods and recreational services component of the CPI was substantially less. Thus, it could be inferred that Corps concessionaires may have raised their prices by an amount less than the U.S. average during 1973.

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[9] The year 1973 may have been a typical in terms of water levels at various Corps projects. This problem is discussed further in Chapter 5.

Such inference is reinforced by the requirement under the leasing agreements that each district office approve price changes initiated by the concessionaires. Due to the possible lag in the approval process, it is quite possible that concessionaire profits were adversely affected during 1973 by their inability to generate the necessary price increases. On the other hand, due to the above-mentioned lag, the demand for recreational services on average was not reduced as much because of price increase moderation. These figures, of course, do not take into account the substantial increases in the prices of gasoline and motor oil which began in the fall of 1973; however, these increases took place after the major summer season of these concessionaires, as is indicated in Table 3.7. In summary, the year 1973 appears to be average in terms of overall economic activity with the possibility that firms were somewhat constrained in passing cost increases on to consumers.

Table 3.8 presents business failure trends at the national level and in states associated with the Corps districts chosen in this study. As expected from the above discussion, 1973 was marked by a lower business failure rate nationally than in the previous three years. An examination of the state rates over time shows failure rates higher than the national rates in only two of the selected states, Illinois and Texas. The reported failure rate in 1973 was higher than in 1972 in the states of Illinois, Arkansas, Oklahoma and Nebraska all of which have substantial agricultural sectors. One might possibly infer that business conditions were poorer in 1973 than in 1972 in the Corps districts of St. Louis, Tulsa, Little Rock, and Omaha but it would be a rather weak inference from this data. Additional information on growth in market demand for the projects will be covered in a later chapter.

In summary we can conclude that the following economic climate existed in 1973, the principal year of this study:

1. Nationally, the economy was rather properous compared with previous years. Inflation had increased but the effects of the "energy

TABLE 3.6

SELECTED ECONOMIC STATISTICS, UNITED STATES
1965-1974

Year	Growth in Real GNP from Previous Year (%)	Unemployment Rate: Total (%)	Unemployment Rate: Service Workers (%)	Change in CPI from Previous Year (%)	Change in CPI for Recreational Goods from Previous Year (%)	Change in CPI for Recreational Services from Previous Year (%)
	(1)	(2)	(3)	(4)	(5)	(6)
1965	6.3	4.5	N.A.	1.7	N.A.	N.A.
1966	6.4	3.8	N.A.	2.9	N.A.	N.A.
1967	2.7	3.8	4.5	2.9	N.A.	N.A.
1968	4.6	3.6	4.4	4.2	N.A.	N.A.
1969	2.5	3.5	4.2	5.4	N.A.	N.A.
1970	-0.3	4.9	5.3	5.9	N.A.	N.A.
1971	3.2	5.9	6.3	4.3	0.8	1.5
1972	6.3	5.6	6.3	3.3	1.2	2.5
1973	5.9	4.9	5.7	6.2	1.2	3.1
1974	-2.1	5.6	6.3	11.0	5.3	5.9

Sources: Column 1: Survey of Current Business, various issues. Columns 2-6: Monthly Labor Review, various issues.

N.A. -- not available.

TABLE 3.7

GASOLINE COMPONENT OF CPI
1970-1974

Year and Month		Gasoline Price Index (1967 = 100)
1970		105.6
1971		106.3
1972	January	106.7
	April	105.0
	July	106.9
	October	110.2
1973	January	110.7
	April	113.8
	July	118.8
	October	121.8
1974	January	140.1
	April	161.4
	July	167.7
	October	160.9

Source: Monthly Labor Review, various issues.

TABLE 3.8

BUSINESS FAILURE TRENDS BY CORPS DISTRICT AND STATES
1970-1973

District and States*	Failure Rate Per 10,000 Listed Concerns 1970	1971	1972	1973
United States	44.0	42.0	38.0	36.0
Nashville				
Tennessee	40.5	28.0	29.8	26.2
Kentucky	24.5	16.7	39.8	36.1
St. Louis				
Illinois	37.1	48.2	38.8	43.7
Little Rock				
Arkansas	19.1	13.1	13.0	15.8
Missouri	12.4	19.1	17.7	14.5
Pittsburgh				
Pennsylvania	31.5	31.1	29.5	28.0
Tulsa				
Oklahoma	31.8	23.6	17.4	23.9
Omaha				
Nebraska	19.2	30.7	15.7	29.9
Fort Worth				
Texas	43.2	51.6	58.0	43.1

Source: Business and Economics Department, Dun and Bradstreet, Inc., The Business Failure Report 1973 (New York, 1974), pp. 2 and 5.

*The district may only include part of the state.

crisis" and the "oil embargo" had not been translated into higher prices for gasoline and oil until the end of the year. As a result, there was no economic impact on the recreation industry, nationally, from these events.

2. Cost inflation from other sources, coupled with the lags in obtaining price increases, may have caused a squeeze on some concessionaire's profits during this year. Regionally, there may have been some pockets of economic recession which caused above-average business failure rates. Allowances are made for these interregional differences later in the study.

CHAPTER 4

CONCESSIONAIRE SAMPLE AND SUMMARY STATISTICS

Introduction

As noted earlier, the major objective of this study is to identify significant characteristics of "successful concessionaires" to allow Corps of Engineers planners to better attract private capital into Corps projects. To provide the data necessary for such analysis a large sample of potential concessionaires was chosen from the seven districts. In fact, it was determined early in the study to acquire data from as many of the 312 concessionaires which reported in 1973 as time and expense permitted. In this and the remainder of the study the term concessionaire refers to a firm with a lease permit from the Corps on a given project having operated at least one full year (see Appendix B for a summary of lease arrangements).

Although the Corps of Engineers has 2,718 recreation areas on its 407 projects, only 1,911 of these areas are managed by the Corps, as shown in Table 4.1. Furthermore, scattered throughout the Corps projects are approximately 700 concessionaires under lease agreements, but only 406 are directly leased from the Corps of Engineers. It has been determined that most of the latter are marinas (47 per cent are full-service marinas with boat sales, rentals, repairs, etc.), with many having nearby sleeping accomodations such as private lodges, motels, etc.[1] Of these 406 Corps-leased concessionaires, only 312 filed reports in 1973, the year chosen for study. The general characteristics of these concessionaires were summarized earlier in Chapter 3 where it was pointed out that solicitations for data were made from 237 concessionaires, or 75 per cent of those reporting. The Balance Sheets and Income Statements were requested from the seven selected district offices for each of its concessionaires for the years 1969 through 1974. Where these were unavailable, an attempt was made to obtain the latest statement on file with the district headquarters.

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[1] SBA Study, op.cit., p. 48.

TABLE 4.1

MANAGEMENT OF ALL CORPS RECREATION AREAS, 1973

Agency	Number Managed	Per Cent
	(1)	(2)
Corps of Engineers	1,911	70.3
Other Federal Agencies	38	1.4
States	364	13.4
Local Governments	252	9.3
Private	153	5.6
	2,718	100.0

Source: RRMS, 1973, D-17.

It was anticipated that the districts would have various formats for collecting and/or approving annual statements from their respective concessionaires. This proved to be the case. These widely varying accounting practices, along with the relatively incomplete nature of many of the annual statements, caused serious problems in the selection of a useful concessionaire sample and in the standardization of data. Individual concessionaires are not required to report regularly in some districts, and the fiscal years reported differed among the concessionaires. It is understandable why the recent SBA Study used only 62 concessionaires for its analysis (in fiscal year 1969); why the Hastings Study apparently found only 76 useful concessionaire reports (in fiscal year 1968);[2] and why the St. Louis survey used only 22 concessionaires in its study.[3] A discussion of the formats and accounting practices followed by concessionaires is presented later. It should be noted that recommendation "G" of the St. Louis Study concerned the needs for standarization of accounting and reporting for these concessionaires.[4]

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[2] SBA Study, pp. 48-49.

[3] St. Louis Study, Guidelines for Developing Commercial Marina Concessionaires, U.S. Army Corps of Engineers, Water Resource Developments, St. Louis District, 1974, p. 24.

[4] See Chapter 2, p. 16, No. 6 of this report.

To reiterate, it was the intention of this study to identify profitable concessionaires and determine the cause for their success for as many years as possible, the minimum being the past five years [1969 to 1974]. Similarly, it was our intention to analyze unprofitable concessionaires to determine the cause for their unprofitability. Logically, those concessionaires which were unprofitable for many years would not continue in business and it was assumed that only a few years of data would be available for them. As expected, only a few years of data were available for any particular concessionaire [both profitable and unprofitable] and complete sets of 1973 data were available for only 94 concessionaires, or 30 per cent of the 312 concessionaires reporting in 1973.[5] A summary of important statistics for the 94 concessionaires is contained in Table 4.2.

By way of contrast, Corps concessionaires are smaller than those operating on National Park Service lands.[6] As seen in Table 4.2 [column 4] the largest Corps concessionaire in 1973 had receipts of $854,032; and from the figures in column 5, the relative disparity in net sales size is small among the 94 concessionaires studied. The asset size shows more disparity with the largest concessionaire having assets over $1.6 million. The greatest relative variability in Table 3.2 is the net profit figure with the average being negative, -$2,689, the largest being $57,846 and the lowest being -$516,519. Similarly, the net worth of all the concessionaires shows relatively high variability compared with other financial characteristics; but this item merely reflects past profits and losses as well as capital additions and withdrawals.

By way of comparison, in its 1969 data analysis, the SBA Study used 62 concessionaires with average gross sales of only $63,380 and average fixed assets of $91,500, with no concessionaire exceeding gross sales of over $500,000.[7] Of the 94 companies in our study, a similar skewness exists, as is apparent from the summary figures in Table 4.3.

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[5] The actual list of concessionaires and recreation areas is not contained in this study to prevent disclosure of information.

[6] SBA Study, pp. 49-50.

[7] Ibid., p. 50.

TABLE 4.2

SELECTED STATISTICS FOR SAMPLE OF 94 CONCESSIONAIRES, 1973

Item	Mean	Standard Deviation	Lowest	Highest	Coefficient of Variation* (Per Cent)
	(1)	(2)	(3)	(4)	(5)
Net Sales	$132,303	$117,276	$ 10,505	$ 854,032	88.6
Wages-employees (n=84)	23,685	27,381	269	205,709	115.6
Wages-officers (n=29)	14,128	10,062	1,344	36,400	71.2
Total Assets (000's)	163,212	192,949	10,328	1,658,996	118.2
Net Worth	58,888	68,494	-549,464	292,144	116.3
Net Profit	-2,689	57,039	-516,519	57,846	2,121.0
Cash Flow	11,661	52,807	-443,636	102,198	452.8

*Calculated by dividing the standard deviation by the mean.

By most standards the concessionaires operating at Corps projects are small firms with approximately 80 per cent having sales and assets less than $200,000. Moreover, 1 out of 5 of those studied had less than $50,000 in annual sales in 1973, and only 9 of the 94 had assets over $300,000. Of the total sales of the 94 concessionaires in 1973 of $12,440,018, about 42 per cent of these sales were by the 17 largest concessionaires. The sample of concessionaires in this study is similar to those used in the Hastings Study, the SBA Study and the St. Louis Study. The

TABLE 4.3

DISTRIBUTION OF FIRMS BY GROSS SALES AND TOTAL ASSETS FOR 94 SAMPLE CONCESSIONAIRES, 1973

Range	Gross Sales		Total Assets	
	By Number	Per Cent	By Number	Per Cent
	(1)	(2)	(3)	(4)
$1,000,000 or over	0	0	1	1
500,000 to 999,000	2	2	3	3
300,000 to 499,000	4	4	5	5
200,000 to 299,000	11	12	12	13
100,000 to 199,000	31	33	34	36
50,000 to 99,000	26	27	26	27
0 to 49,000	21	22	14	15
	94	100	94	100

Source: Calculated from concessionaire annual reports.

relative sample performances should thus be similar, also. It should be clear from the aforementioned studies that the problems associated with small business generally are the problems of the Corps concessionaires. Moreover, there is every likelihood that some of the same concessionaires are included in these studies due to the availability of their financial records, although a cross reference has not been made between those companies in the various studies.

Salient Statistics of Profitable and Unprofitable Concessionaires

Since the focus of this study is the determination of why some concessionaires are profitable and some not, the nature of the two groups is outlined below, providing the subject of the statistical analysis in Chapters 5 and 6.

While considerable detailed analysis of the profitable concessionaire is contained in Chapter 5, it is important to note that the relative size of the two groups (profitable (P) and unprofitable (UP)) differs. The outstanding characteristic apparent in Table 4.4 is the greater relative variability (measured by the coefficient of variation) of the net sales and assets of the unprofitable concessionaires compared with profitable ones. The more efficient use of assets of the profitable concessionaires may be a partial explanation of their management success as suggested by the figures in columns 1 and 5. For the P group average sales are about 94 per cent of average assets. For the UP group average sales are only 66 per cent of average assets. From this brief review, the UP group, on average, appears to have a larger volume of non-earning assets than the P group. It should be noted, however, that in calculating the coefficient of variation the greater size variability of the UP group makes the use of means subject to a possibly severe size bias. Further relationships between and among the P and UP groups are explored in the statistical analysis in Chapters 5 and 6.

To gain further information on the characteristics of the most profitable concessionaires, 15 were chosen from the 94 on the basis of having the highest return on assets (see Table 4.5). Note that only 4 of the 15 most successful concessionaires were larger than the average of all 94 concessionaires (column 4). Moreover, most of the successful concessionaires were sole proprietorships as opposed to the 15 most unsuccessful concessionaires (again based on return on assets) listed in Table 4.6 which were largely corporations (column 7). As an indication of the management philosophies of the two different groups,

TABLE 4.4

CHARACTERISTICS OF SAMPLE PROFITABLE AND UNPROFITABLE CONCESSIONAIRES AT CORPS PROJECTS, 1973
(Amounts in thousands of dollars)

Item	Mean	Standard Deviation	Low	High	Coefficient of Variation* (Per Cent)
	(1)	(2)	(3)	(4)	(5)
			PROFITABLE (P), N=53		
Net Sales	$141.3	$ 93.1	$ 10.5	$ 507.2	65.8
Net Profits	14.6	14.4	.4	57.8	99.1
Total Assets	150.5	116.3	14.3	542.3	77.3
Net Worth	82.5	76.8	.0	292.1	93.1
Cash Flow	28.0	22.2	3.2	102.2	79.4
			UNPROFITABLE (UP), n=41		
Net Sales	120.6	143.1	18.1	854.0	118.5
Net Profits	-25.1	79.9	-516.5	-.9	318.7
Total Assets	179.7	261.7	10.3	1,658.9	145.6
Net Worth	28.4	39.3	-549.5	192.5	138.4
Cash Flow	-9.5	70.9	-443.7	29.6	745.9

*Calculated by dividing the standard deviation by the mean.

the P group had fewer outstanding current debts compared with the UP group (see column 3), the latter having current ratios well above the mean for the entire sample of 94 concessionaires. Not one P group concessionaire of the 15 listed had a current ratio above the mean of the 94 firms. Other important ratios show similar significant differences as will be noted later in this analysis.

TABLE 4.5

SELECT CHARACTERISTICS OF 15 MOST PROFITABLE CONCESSIONAIRES, 1973

Firm Code Number	Project	District	Return on Assets (Per Cent)	Return on Sales (Per Cent)
			[1]	[2]
70	Table Rock Lake	[LR]	29.4	15.3
5	Lake Cumberland	[N]	27.9	24.3
9	Dale Hollow Lake	[N]	27.4	25.9
13	Dale Hollow Lake	[N]	26.8	14.7
53	Bull Shoals Lake	[LR]	23.1	15.8
3	Lake Cumberland	[N]	22.8	15.5
17	Dale Hollow Lake	[N]	21.5	14.0
91	F. Gibson Lake	[T]	21.0	25.9
16	Dale Hollow Lake	[N]	18.8	9.9
1	Lake Cumberland	[N]	18.6	16.2
161	Lewisville Dam	[FW]	15.0	13.4
162	Lewisville Dam	[FW]	14.6	16.5
51	Bull Shoals Lake	[LR]	14.7	18.2
48	Bull Shoals Lake	[LR]	14.6	31.0
78	Eufaula Lake	[T]	13.6	3.1
Mean of all 94 Concessionaires			1.01	18.5

TABLE 4.5 (Continued)

SELECT CHARACTERISTICS OF 15 MOST PROFITABLE CONCESSIONAIRES, 1973

Firm Code Number	Project	District	Current Ratio[a]	Total Assets ($000)	Net Sales ($000)	Net Profit[b] ($000)	Firm Type
			(3)	(4)	(5)	(6)	(7)
70	Table Rock Lake	(LR)	.12	$ 21.9	$ 42.2	$ 6.6	Proprietorship
5	Lake Cumberland	(N)	.21	187.0	214.4	52.2	Proprietorship
9	Dale Hollow Lake	(N)	.04	210.9	223.1	57.8	Corporation
13	Dale Hollow Lake	(N)	.14	86.9	158.3	23.3	Proprietorship
53	Bull Shoals Lake	(LR)	.12	66.3	96.6	15.3	Proprietorship
3	Lake Cumberland	(N)	.81	72.1	105.7	16.4	Partnership
17	Dale Hollow Lake	(N)	1.65	92.4	142.2	19.9	Corporation
91	F. Gibson Lake	(T)	1.70	204.1	165.8	42.9	Proprietorship
16	Dale Hollow Lake	(N)	.05	34.9	66.5	6.6	Partnership
1	Lake Cumberland	(N)	.21	199.5	229.1	37.2	Proprietorship
161	Lewisville Dam	(FW)	.68	122.0	137.4	18.4	Corporation
162	Lewisville Dam	(FW)	1.88	147.1	129.7	21.5	Corporation
51	Bull Shoals Lake	(LR)	1.35	43.7	35.3	6.4	Proprietorship
48	Bull Shoals Lake	(LR)	.0	86.7	40.8	12.7	Partnership
78	Eufaula Lake	(T)	1.08	43.0	189.0	5.9	Corporation
Mean of all 94 Concessionaires			3.29	$161.8	$130.9	-$ 2.7	

Source: Annual reports of concessionaires.

[a]Calculated as current liabilities divided by current assets.

[b]As reported by concessionaires.

TABLE 4.6

SELECT CHARACTERISTICS OF 15 MOST UNPROFITABLE CONCESSIONAIRES, 1973

Firm Code Number	Project	District	Return on Assets (Per Cent)	Return on Sales (Per Cent)
			(1)	(2)
61	Greers Ferry Lake	(LR)	-53.3	- 38.9
31	J. Percy Priest Dam	(N)	-32.3	- 34.0
33	J. Percy Priest Dam	(N)	-31.1	-128.1
68	Table Rock Lake	(LR)	-30.3	- 41.0
65	Norfolk Lake	(LR)	-27.8	-207.5
74	L. Francis Case	(O)	-24.1	- 17.4
157	Waco Lake	(FW)	-21.4	- 29.1
20	Center Hill Lake	(N)	-18.1	- 46.8
55	Greers Ferry Lake	(LR)	-18.1	- 26.7
88	Fort Gibson Lake	(T)	-16.7	- 8.4
36	Carlyle Lake	(SL)	-16.5	- 28.1
144	Grapevine Lake	(FW)	-15.7	- 7.1
44	Beaver Lake	(LR)	-12.4	- 15.4
45	Beaver Lake	(LR)	-10.9	- 8.4
159	Whitney Lake	(FW)	-10.9	- 72.5
Mean of all 94 Concessionaires			1.01	18.5

TABLE 4.6 (Continued)

SELECT CHARACTERISTICS OF 15 MOST UNPROFITABLE CONCESSIONAIRES, 1973

Firm Code Number	Project	District	Current Ratio[a]	Total Asset ($000)	Net Sales ($000)	Net Profit[b] ($000)	Firm Type
			(3)	(4)	(5)	(6)	(7)
61	Greers Ferry Lake	(LR)	.23	$ 82.0	$114.5	-$ 46.2	Corporation
31	J. Percy Priest Dam	(N)	.31	80.2	76.4	- 25.9	Corporation
33	J. Percy Priest Dam	(N)	8.90	1,659.0	403.2	- 516.5	Partnership
68	Table Rock Lake	(LR)	.05	128.5	94.9	- 38.9	Corporation
65	Norfolk Lake	(LR)	.0	135.0	18.1	- 37.6	Corporation
74	L. Francis Case	(O)	.0	37.5	51.8	- 9.0	Proprietorship
157	Waco Lake	(FW)	4.90	130.4	95.9	- 27.9	Corporation
20	Center Hill Lake	(N)	6.50	296.2	114.7	- 53.6	Corporation
55	Greers Ferry Lake	(LR)	.05	169.7	115.0	- 30.7	Corporation
88	Fort Gibson Lake	(T)	2.02	10.3	20.4	- 1.7	Corporation
36	Carlyle Lake	(SL)	3.31	159.2	93.0	- 26.1	Corporation
144	Grapevine Lake	(FW)	3.88	168.1	373.4	- 26.4	Corporation
44	Beaver Lake	(LR)	.59	99.8	80.6	- 12.4	Corporation
45	Beaver Lake	(LR)	.45	158.3	205.3	- 17.3	Corporation
159	Whitney Lake	(FW)	3.26	321.1	48.2	- 35.0	Partnership
Mean of all 94 Concessionaires			3.29	$ 161.8	$130.9	-$ 2.7	

Source: Annual reports of concessionaires.

[a]Calculated as current liabilities divided by current assets.

[b]As reported by concessionaires.

Of the Corps districts represented in the P group, 7 of the most successful concessionaires operate on projects in the Nashville District. However, there is no preponderance of successful operators in the Nashville District since 3 of the most unprofitable ones also operated there. If there is a most successful Corps project in the sample, it is Dale Hollow Lake in the Nashville District which contains 4 of the most successful 10 concessionaire operations in the entire sample. On the other hand, Nashville District's J. Percy Priest Project and Little Rock District's Greer's Ferry Project both contain 2 of the most unprofitable operations of the entire sample. These apparent patterns may be partly misleading, however, since a sizeable amount of the collected concessionaire data came from these two districts. In this regard, the sample is biased towards the behavior of firms in these two districts. Of more importance are the reasons for a concessionaire to be profitable or unprofitable regardless of its location.

Paired Samples from Year to Year

In order to analyze the changes that have occurred over several years, the original sample of concessionaires is subdivided into those for whom data were available for 1970 through 1974. Table 4.7 summarizes the number of concessionaires for which there were sufficient data by the years for which data are available.

To complete an analysis over time, those concessionaires having consistently profitable years of operation were identified and are summarized in Table 4.8.

By comparison with the data in Table 4.7, it is obvious that between 1971 and 1973 considerable change took place in the number of consistently profitable concessionaires. In 1971, there were 44 profitable concessionaires but by 1973 only 27 of these same concessionaires continued profitable, even though there were 53 profitable concessionaires in 1973. This

TABLE 4.7

NUMBERS OF SAMPLE CONCESSIONAIRES WITH USEFUL FISCAL YEAR DATA AND PROFIT STATUS

Year	Total Concessionaires with Full FY of Data	Profitable Concessionaires Number	Profitable Concessionaires Per Cent	Average Profit ($000)	Unprofitable Concessionaires Number	Unprofitable Concessionaires Per Cent	Average Loss ($000)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1974	59	35	59	12.6	24	41	-13.0
1973	94	53	55	14.0	41	45	-12.5
1972	86	53	62	11.9	33	38	-14.9
1971	76	44	58	11.1	32	42	-13.9
1970	63	34	54	10.2	29	46	-13.1

Source: Calculated from annual statements of concessionaires.

TABLE 4.8

CONCESSIONAIRES WITH CONSECUTIVE PROFITABLE OPERATIONS OVER THE PERIOD 1971-1973

Years	Number
1972-1973	42
1971-1973	27

reflects largely the inadequacy of the 1971 data as well as the profit pattern of these firms. To identify reasons for the consistently profitable operations of these 27 concessionaires provides a good insight into the character and profile of the "profitable concessionaire." By the same logic, those concessionaires which consistently lost money over the 1971-1973 period should provide insights into the "unprofitable concessionaire." While it is possible that many of the unprofitable firms went out of business over the three-year period, it is also possible that some moved into the profitable group over this same period. In fact, in 1973 there were only 11 of the same unprofitable concessionaires which were also unprofitable in 1971. And 10 of those which were unprofitable in 1971 were profitable by 1973.

CHAPTER 5

MODEL CONSTRUCTION AND ESTIMATION

Introduction

The theoretical framework for our model of the typical operating concessionaire at Corps projects is presented in this chapter. In the development of the model, use was made of economic theory as well as the knowledge gained from on-site and telephone interviews with concessionaires at Corps projects. Two specifications of the general model are estimated using the statistical techniques of multiple regression and discriminant analysis. In presenting the empirical estimates of the models, their limitations and possible specification errors are discussed so that users of the models will be better informed regarding their interpretation. As pointed out in the past two chapters, 1973 was chosen as the year for which estimates of the models were made. Possible statistical problems regarding this choice are discussed in later parts of this chapter.

The outline of the chapter is as follows. In the first section, the theoretical model which serves as a basis for later empirical work is developed. To assist in the specification of the model, given the large numbers of variables at our disposal, an examination is made in the second section of simple correlations among the dependent variables, and between the dependent variables and the set of independent variables. In the next chapter the regression models which explain variations in various rate-of-return variables in terms of variations in the values of a set of independent variables are presented along with the discriminant model which divides the firms into profitable and unprofitable categories and establishes a decision rule for classifying the firms into either of these two categories. The final chapter (Chapter 6) assesses the results from both the regression models and the discriminant models.

Development of the Theoretical Model

In developing a model of the concessionaire operating under permit from the Corps, the first step must be to determine the primary purpose of the model. Moreover, if the main concern was in testing hypotheses about the behavioral characteristics of the firms as they relate to fundamental economic variables, a structural model of the firm operating within this type of environment would have to be specified. In such a structural model, a variety of simultaneous equations would be needed describing, among other things, the general demand for recreational services within the market, the individual firm's share of the market, and the firm's production function. In this specification, equations could be developed explaining the firm's total revenues, costs, and profits, under the assumption of perfect competition in the product market. Similarly, an equation could be developed explaining the firm's rate of return on its investment by variations in other endogenous and exogenous variables in the system of equations. From this first approach, one hopefully ends up with a system of simultaneous equations which are at least in part identifiable and hence estimable using various simultaneous equation estimators. Introduced in the construction of this system are behavioral and technical relationships and identities to explain the phenomena under study. The advantage of such an approach is its ability to allow for the testing of specific behavioral hypotheses about the firm. This approach, of course, would also provide some insight into the exogenous economic forces affecting the firm's profitability by solving the estimated structural system for the reduced form equations. [A reduced form equation is an equation relating one particular endogenous variable to the set of all exogenous variables in the system of simultaneous equations.] The major disadvantage of this approach is the need for very careful specification of the structural relations to minimize the possibility of specification error as well as the very definite possibility that the system would be nonlinear in the variables [although this latter condition is solvable, albeit at a substantial cost of man-hours and computer time].

The second approach, and the one adopted in this study, is to specify and estimate reduced form equations directly since the principal usage of the model will be for predicting firm profitability. In this approach, one specifies sets of variables which, in theory, have their basis in some theoretical structural equation and which, in the reduced form, should explain some of the variability in the profit rates examined. After the reduced form equations are specified and estimated directly, they can be used for forecasting purposes.

One other important point should be mentioned about the theoretical model developed in this research effort. The model is a cross section model which uses data for the year 1973. Where change is important, differences have been calculated in the data in order to attempt to capture some of the time-related adjustments of the concessionaires. However, the model will be a static one and cannot be interpreted to indicate the time paths of profitability in response to time changes in exogenous variables. As such, the model should be interpreted as representing the long-run equilibrium behavior of firms; and interpretations of the coefficients should be only made in terms of a comparison of one concessionaire with another.[1]

The endogenous or dependent variable of interest is the firm's profit rate--however defined.[2] By

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[1]Meyer and Kuh, among others, argued this point in a different context. According to them:

"Insofar, as demand studies are concerned, it is quite possible, as will be argued at length, that the kind of behavior measured from cross-section data is commonly long-run in nature, while that which one observes with annual time series is more often of a short-run character." Edwin Kuh and John Meyer, "How Extraneous are Extraneous Estimates?" Review of Economics and Statistics, 39 [November, 1957], pp. 380-93.

[2]According to economic theory, investment capital flows to wherever it receives the highest return. While it is impossible to guarantee a rate of return to investors in a relatively competitive market atmosphere, it is the intention of this study to determine those factors that are associated with high rates of return for concessionaires and in this way to "suggest" ways of being profitable to potential investors in Corps projects.

focusing our attention on the rate of return, size effects can be controlled in the reduced form model; otherwise, the use of the firm's absolute level of profits would obviously be related to the size of the firm. The following three specifications of the profit rate were chosen for the subsequent analysis: 1. Rate of return on net sales; 2. Rate of return on assets; 3. Rate of return on net worth.

The rate of return on net sales measures profits (or losses) as a per cent of sales net of returns and sales tax collections. Although in economic theory it is difficult to imagine firms attempting to maximize this profit rate or using it in their decision making, it is used here because other studies in financial analysis rely on it and became many businessmen put some emphasis (at least verbally) on this measure of profitability.

The second specification of the profit rate is the rate of return on total assets which expresses profits as a per cent of total current and fixed assets. This measure has much firmer grounding in economic theory since it measures the efficient use of assets which generate a return to all investors in the firm including the firm's owners and those financial institutions which have provided financing to the firm. As we shall see later, this profit rate provides a much more meaningful measure of the firm's current operating position, since it is somewhat independent of the firm's experience in prior years. This specification is also extensively used in other studies.[3]

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[3]The SBA Study employs all three of the measures used in our analysis. Moreover, the measures of return used in this study are standard in most financial analysis, along with several others. For example, the Federal Deposit Insurance Corporation uses these measures (except for the rate of return of sales) in its annual evaluation of banks. See Bank Operating Statistics, Washington: Federal Deposit Insurance Corporation.

The third specification of the profit rate is the rate of return on net worth, which expresses profits as a per cent of the firm's net worth. This measure also has firmer grounding in economic and financial theory than the rate of return on net sales since it represents the current return on an individual's investment in the firm. As such, a comparison of this measure with alternative rates of return in other investments will dictate, in theory, whether or not individuals will decide to invest financial resources in the firm or elsewhere. Consequently, this measure of profitability is ideal in deciding whether or not a particular concessionaire is a profitable use of one's financial resources. Unfortunately, it not only represents the profitability prospects of the firm over the current year, but it also includes the cumulative experience of the firm over the lifetime of the present management, since the net worth of the firm is affected by both the profitability or lack thereof in prior years and the withdrawals and additions of financial resources from and to the firm. While this measure may seem to be ideal for the purposes of this study, for reasons that will be explained later, our focus is primarily on the rate of return on total assets.

With regard to the sets of independent variables, it is assumed that each concessionaire operates within a limited market area of 50 miles and that the demand for each concessionaire's services is market-determined and thus not easily controlled by the individual concessionaire's actions. Consequently, the basis for the development of the model lies in the assumption of competitive markets for concessionaire services. Additional evidence supporting this assumption is reported in the interviews with individual concessionaires, discussed in Appendix C, and in the fact that the leasing policies of the Corps require the Corps to approve all schedules of prices, as discussed in Appendix B.

The sets of independent variables used in the construction of the model are as follows. The first set is termed the market variables, which collectively determine the demand for recreational services in the market area served by the individual firm. The second set is termed the project variables, which

collectively determine both the demand for and supply of recreational services at the Corps project on which the firm is located, relative to other competing suppliers of recreational services in the same market area. The third set is termed the firm variables, which collectively determine both the demand for the individual firm's recreational services relative to other firms on the project and the supplies of the recreational services of the firm. The last and final set of variables is termed the Corps variables, which account for differences in administration of concessionaires among Corps districts. A list of all of these sets of variables and other variables collected in this study and their associated definitions is presented in Appendix A. In the remaining portion of this section a discussion of the specific variables examined in our analysis is presented, followed by a consideration of the empirical estimation of the model in Chapter 6.

As indicated above, the market variables collectively and individually determine the general form of the demand for recreational services in the 50-mile radius market area surrounding the firm. From economic theory, the demand for a good or service which is nondurable [as recreational services are] is dependent upon the price of the good, the price of related goods and services, and the income of consumers. Further refinements may also account for the size of the market in terms of households or individuals. Unfortunately, it is impossible in a study of this limited a scope to collect adequate data on prices of recreational services and related goods and services. Even if one had access to these prices, the problem of somehow aggregating the extensive prices of all the different goods and services which collectively make up recreational services would be substantial. Fortunately, the assumption of a competitive product market together with the Corp regulation of prices means that the effects of price variations among markets in this cross-section study can be minimized. This would not be possible in time series studies of the same phenomena where, presumably, one would encounter substantial variations in prices, particularly in light of the recent gasoline crisis.

As a consequence, while there is the possibility of specification error with resulting biases in the estimates of coefficients of variables related to price, these latter will be minimal compared with other potential problems in our analysis.

Presented in Table 5.1 is a list of the set of independent variables relating to the market forces affecting the demand for recreational services in the market area. These variables measure, in various ways, the following: the number of households or population, gross income, total retail sales as a measure of economic activity in the area, per capita measures of income, measures of the income distribution in terms of those households most likely to consume recreational services provided at Corps projects, changes over time in population and income, and boat registrations in the market. In all cases, the variables examined at this stage of the analysis were expected to have a positive relationship with the measures of profitability defined earlier in this chapter. The expected sign of these and the other sets of variables is indicated in Table 5.1.

The second set of variables, termed the project variables, collectively determine both the demand for and supply of recreational services at the project relative to other suppliers of recreational services in the market area. As a first step, an examination was made of those variables within this set which serve as indicators of the supplies of recreational services at the project. Such variables include measures of boat ramps and lanes available, number of rental units available, the age of the project, the total shoreline and water areas, and the purposes for which the project was built.

A second group of variables in this set measures the effective demand for the recreational services provided on and in the project. Such variables measure the total number of visitation days, the average family usage on weekends during the peak month, the proportion of attendance during the summer months, the percentage of attendees engaging in waterskiing, boating, and fishing, and measures of water level fluctuations during March through October (see the discussion in Appendix C).

TABLE 5.1

VARIOUS SETS OF INDEPENDENT VARIABLES AND EXPECTED SIGNS BETWEEN DEPENDENT VARIABLES

Sets Of Variables	Independent Variables	Expected Sign
Market	HOUSHLDS	+
	NET--EBI	+
	RES--1973	+
	CMEAN--73	+
	TPI--1973	+
	POP--1973	+
	HPC1DUP	+
	HPC15UP	+
	CPOP23	+
	CPOP13	+
	CMEAN23	+
	CMEAN13	+
	BOATREG	+
Project	TWTRA	+
	TSHORE	+
	PJSUMATT	+
	FLDCONTL	-
	POWER	-
	NAVIGATN	-
	IRRIGATN	-
	RECREAT	+
	FISHWILD	+
	WTRSPLY	?
	YEARFULL	-
	RLL	+
	RLR	+
	RRENTU	+
	TATNDCRA	+
	PWATRSKI	+
	PERBOAT	+
	PERFISH	+
	AWFDUDPM	+
	WRANGE	-
	WTRVAR	-

TABLE 5.1 (Continued)

VARIOUS SETS OF INDEPENDENT VARIABLES AND EXPECTED SIGNS BETWEEN DEPENDENT VARIABLES

Sets of Variables	Independent Variables	Expected Sign
Firm	CURRATIO	-
	ACIOTEST	-
	CLIABNTW	-
	WORKCAP	+
	NTWTHLIB	+
	NSGFA	+
	MSALNS	-
	INTEXP	-
	ADVEXP	+
	WAGEXP	-
	BTSPACE	+
	VISIT	+
	VISTMKT	+
	CONSRENT	+
	CMORNEED	+
	CORPORAT	?
	MARINA (or BOATS)	?
Corps	NASHVILL	?
	STLOUIS	?
	LITLROCK	?
	PITTSBRGH	?
	OMAHA	?
	FTWORTH	?
	TULSA	?

Collectively, the two groups of project variables determine the relative demand and supply of recreational services at the projects studied. The expected sign of the relationship between this set of independent variables and the measures of profitability defined earlier are also indicated in Table 5.1.

The third set of variables, termed the firm variables, measure the demand and supply of recreational services of the individual firm relative to other firms on the same project. The first group of variables in this set measure either the specific supplies of recreational service provided or the costs associated with the provision of the services. This group includes the following: standard financial measures of operating performance, costs of wages, officers' salaries, advertising, and interest, as percentages of total expenditures; and number of boat spaces provided, assuming the firm is a marina.

The second group of variables in this set measures the demand for recreation services and includes the following: percentage of boat spaces for rent and the number of new boat spaces needed, total visitations to the recreational area of the firm and the share of visitations relative to the entire attendance. The third and final group of variables within this set measures the characteristics of the firm which may affect profitability and include whether or not the firm was a corporation and/or marina.[4]

The major ommissions from this third set of variables are specific management variables which could possibly have a substantial effect on the success of the concessionaire, based upon our personal interviews as summarized in Appendix C. The financial measures of operating performance and cost variables should explain a portion of the total difference in managerial ability among the firms; however, as in many other economic studies, no good measures of the

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[4]The MARINA variable is based upon the Corps definition; however, in the records there were firms not classified as marinas which had boat spaces. Hence, the BOATS variable may be a better specification.

management factors were available even though, as the Small Business Administration study concluded, they may be the major determinant of successful concessionaire operations. Thus, of the sets of variables considered in this study, the most severe ommission is the management variables. The expected sign of the relationship between the third set of independent variables and the measures of profitability defined earlier are indicated in Table 5.1, as well.

The fourth and final set of variables, termed the Corps variables, are introduced into the model to account for possible differences in Corps administration of concessionaires among Corps districts. In addition, since Corps districts are defined on the basis of major watersheds, this set of variables may account for climatic and environmental differences in these watersheds which could affect the individual firm's profitability. Since interviews and statistical evidence indicated that 1973 was somewhat atypical in that it was a year of high water levels, resulting in impaired profit possibilities in some of the districts chosen for this study, we have included these dummy variables for districts in addition to our previously defined water fluctuation variables. As Table 5.1 indicates we have no a priori expectations regarding the signs of these variables as they relate to the measures of profitability defined earlier.

Analysis of Simple Correlations among Dependent Variables

The list of variables from the previous section which could be included in the regression and discriminant models is quite large. Because of the problems of multicollinearity, if all were examined at once, an examination of the simple correlations between these variables and the dependent variables was made to reduce the number of potential regressors in the regression model. Before presenting this discussion, however, some comments are in order about the sample of concessionaires used in the model development. This is followed by a discussion of the simple correlations among the dependent variables, themselves, and finally with the discussion of the simple correlations between the independent and dependent variables.

Prior discussion in Chapters 3 and 4 has indicated how the sample of 94 concessionaires was obtained. In this chapter, because of missing observations for one or more variables, the statistical analysis may be based on fewer than 94 observations. In these instances, the number of observations upon which the analysis is based is clearly indicated in the tables of statistical results. Although data have subsequently been obtained for additional variables of interest (as indicated in Appendix A), the analysis presented herein has been guided by those variables which were felt to be most accurately reported by the parties involved.

As indicated earlier, there are three basic rates of return variables considered: rate of return on net sales, rate of return on total assets, and rate of return on net worth. In the calculation of the firm's profits, an accounting dilemma arose in that there was no consistency in the treatment of inventory changes from one firm to another. Some firms followed standard accounting procedures and reported net profits net of inventory changes over the fiscal year. Other firms reported net profits gross of inventory changes over the fiscal year. Initially, two variants of each rate of return variable were examined. The first variant (indicated by variables RETSALE1, RTASSET1, and RTNTWTH1) adjusted all firms net profits to reflect the changes in inventories over the fiscal year. This type of cost of goods accounting better reflects the inventory accumulation and liquidation which was evident for a number of the firms in the sample. It should be noted that this net profits figure and associated rate of return was correctly reported by a majority of the firms.

The second variant (indicated by variables RETSALE2, RTASSET2, and RTNTWTH2) did not adjust the firm's reported net profits, even if the firm had accounted for inventory changes. This variant thus reflects the net profits figure reported on the firm's income statement and may in many cases be the profit or loss figure on which managerial decisions were based.

In Table 5.2 the simple correlations among the three major rate-of-return variables and their respective variants are presented. A perusal of the table indicates a positive and statistically significant association between the two variants of each of the three dependent variables. The two alternative variants of the rate of return on total assets appear to be most similar, while the two variants of the rate of return on net sales are least similar. In the basic analysis below, use is made of the rate-of-return variables which are adjusted for inventory changes. Later in the regression analysis, an indication is given of whether this makes any difference in the model's explanatory ability.

An examination of the simple correlations among the dependent variables indicates a positive and significant association between the rate of return on net sales and the rate of return on total assets. Not unexpectedly, the rate of return on net worth is not associated with the other rate-of-return variables. As discussed earlier, this is partially attributable to the fact that this rate-of-return variable reflects not only current relative profitability but previous profitability or lack thereof. Net worth can be eroded over time because of continuing losses or withdrawals of capital while, at the same time, there is a less substantial change in the firm's net sales or total assets. Consequently, it should not be surprising if the models explaining the rate of return on net worth perform poorer than models explaining return on assets or sales.

Analysis of Simple Correlations between Dependent and Independent Variables

In the development of the theoretical model in this chapter, several sets of independent variables which should be related to the dependent variables were indicated. The expected signs of these relationships were summarized in Table 5.1. After an exhaustive series of tests of the correlation between these dependent and independent variables, those listed in Table 5.3 provided the starting point for our development of the final regression and discriminant models. The list does not include any of the other

TABLE 5.2

SIMPLE CORRELATIONS AMONG PRINCIPAL DEPENDENT VARIABLES AND ALTERNATIVE MEASURES[a]
(n=94 Observations)

	RETSALE1	RETSALE2	RTASSET1	RTASSET2	RTNTWTH1	RTNTWTH2
RETSALE1	1.000	0.864***	0.694***	0.596***	0.007	0.023
RETSALE2		1.000	0.652***	0.678***	0.018	0.019
RTASSET1			1.000	0.967***	-0.066	-0.038
RTASSET2				1.000	-0.046	-0.044
RTHTWTH1					1.000	0.912***
RTNTWTH2						1.000

[a]Significance level designations are as follows:

*Significant at 10 per cent level (one-tail test).
**Significant at 5 per cent level (one-tail test).
***Significant at 1 per cent level (one-tail test).
+Significant at 10 per cent level (two-tail test).
++Significant at 5 per cent level (two-tail test).
+++Significant at 1 per cent level (two-tail test).

TABLE 5.3

LIST OF STATISTICALLY SIGNIFICANT INDEPENDENT VARIABLES FROM SIMPLE CORRELATION ANALYSIS

PERBDAT	TSHORE
FLDCONTL	NAVIGATN
RLLor RLR	RRENTU
YEARFULL	CONSRENT
MARINA (and BDATS)	CORPDRAT
CLIABNTW	NSGFA
ACIDTEST	INTEXP
WORKCAP	All District Variables

variables considered in this section. It is possible that their lack of confirmation is attributable to a failure in this simple correlation analysis to hold other variables constant as is commonly done for a linear regression analysis.

The major discovery resulting from the above intensive review of the numerous variables included in the study is that so few variables are significantly related to the profitable operations of Corps concessionaires. Most important is the lack of significance of market variables and the apparent significance of project variables and management variables. The variables in Table 5.3 are the pool from which the final models are estimated next in Chapter 6.

Although the statistical findings of this study suggest that market variables in themselves are not of critical importance in explaining concessionaire profitability, this is not to suggest that market factors are unimportant. It should be obvious that a concessionaire without customers would soon be out of business. The findings must be interpreted, rather, as explaining the rate of return or profitability of concessionaires, which is different from explaining the demand for its services. Once it is assumed that a concessionaire has customers, then what factors contribute to a successful or unsuccessful operation? The point to be made is that the purpose of the study was to develop a model of the typical concessionaire's profitability, not to develop a model of the market (demand) for a concessionaire's services.

The study assumed a 50-mile market radius for each concessionaire, but since more than one concessionaire operates at each Corps project, a 50-mile market was assumed for each project as well. It is very difficult to assume that the market for each concessionaire is exactly coterminous with the market for the entire project. However, the individual concessionaire was the focus of the study--primarily with regard to its profitability. Moreover, the failure to carefully delineate the specific market for each concessionaire from that of each other concessionaire may have been instrumental in causing the market factors to take on an unimportant stance in this study. In any event, even with the assumption of a 50-mile market radius, there still exists the problem of overlapping markets, where one project's market is intermingled with that of another. This problem would have been made more serious by enlarging the project market.

In essence, the specification of the models developed from this research minimized the effects of market factors on specific concessionaires. But, as the intent of the study was to primarily highlight the causes of concessionaire profitability, given an existing market, this limitation is not viewed as being particularly severe. To reiterate, in terms of profitability, market factors are not critical, since profitable concessionaires exist on small and large projects, both near large cities and in rural areas. In other words, profitable operations cannot be assured simply because a market exists for that project. The complexities of good management, good location, etc., are the factors that determine profitability, just as with any other kind of product or service. Profits cannot be guaranteed to any potential concessionaire at any project at any time, unless there are large subsidies available.

CHAPTER 6

REGRESSION AND DISCRIMINANT ANALYSIS AND RAYSTOWN PROJECT FORECASTS

Introduction

In this chapter, the estimated regression models are presented along with the associated discriminant analysis. The estimated regression models are based upon the list of important independent variables which were examined in the previous chapter. This list was obtained by an examination of the simple correlations between these variables and the profitability measures. It excludes many variables which, in theory, should affect the firm's profitability but which provided no confirmation based upon the sample data. Initially, we present estimates of the regression models including all of the variables listed in Table 5.10.

Because of the large number of such variables, extensive multicollinearity was found to exist among them affecting our ability to test hypotheses about the coefficients. Since the principal objective is the development of a series of forecasting models, the hypothesis tests have been de-emphasized in this chapter. This is also in accordance with the discussion in Chapter 5, since the regression models examined in this chapter are the reduced form equations and do not constitute behavioral equations. Consequently, the attempt was made to develop relatively simple regression models by eliminating unimportant variables. After presenting estimates of the general regression model some variables are eliminated and the models are re-estimated and presented in final form.

The second part of this chapter parallels the first except that discriminant analysis was employed to develop a procedure to classify firms into either a profitable or an unprofitable category. In the development of this procedure, many of the same independent variables that were used in the estimated regression models are also used as classification variables. To assist the reader, at the beginning of this section a brief survey of discriminant analysis is presented, plus some of its potential problems, before examining the classification results.

The third part of the chapter consists of the forecasts of profitability or unprofitability from the regression and discriminant analyses for the new commercial concessionaire located on the recently constructed Raystown project in Pennsylvania. In developing this forecast, use is made of projections of concessionaire financial positions from the case study of the concessionaire which comprises Volume II of this study. In addition, information was utilized about the characteristics of the project itself. Since there are a number of possible combinations of legal ownership, concessionaire size, and length of lease, among others, a variety of scenarios are presented to forecast both profitability rates and the profitability likelihood of this new concessionaire.

Data Subsets Underlying the Regression and Discriminant Analysis

While there are 94 concessionaires in the sample (as discussed in the previous chapters), both the regression and discriminant analyses were estimated using fewer than this number of concessionaires. As was indicated in the discussion of simple correlations between the firm independent variables and the measures of profitability in the previous chapter, there were a number of cases in which observations were missing for some of the independent variables. Consequently, the sample data were nonhomogeneous in terms of all available data.

As a starting point a subset of the 94 concessions was constructed which consisted of all firms having reported financial data for employees' wages and interest expense. This particular subset was chosen since these and related financial data exhibited significant associations with the profitability measures in Chapter 5. The subset is denoted as firms reporting interest and wage expenses in this chapter.

A second subset was constructed from the first, consisting of all firms reporting employees' wages and interest expense which also have boat slips available. This particular subset is denoted as marinas since, presumably, these boat slips were available for rental

purposes. It should be mentioned that this definition of a marina, which is used throughout this chapter, does not coincide with the Corps definition. In particular, the Corps reports the type of business in which the commercial concessionaire is engaged in the RRMS data system (see reference to MARINA in Appendix A). Unfortunately, as was eventually discovered in our study, the firms which the Corps designates as marinas often do not report boat slips, and, conversely, the firms which the Corps designates as other than marinas often do report boat slips. As a result consistent information could not be obtained on the firms which were marinas by following the Corps' definition and so the relevant definition of marinas used in this study is firms which report boat slips. While it is recognized that under this system some firms may be classified as marinas which may not be providing a full line of marina services, it is judged that this error is probably insignificant in a study of this type. That is to say, of the number of possible biases in a study of this type (some of which were already mentioned), this particular one is of minor importance.

In both subsets examined in this chapter the principal motivation was, as indicated above, a recognition that many of the 94 firms in the sample did not report full sets of data. For example, most firms reported net sales, gross profits, total expenses and net profits on their income statements. Also, most firms reported current assets, fixed assets, current liabilities, and net worth on their balance sheets. However, the important breakdowns of the income statements into detailed sources of income or sales or detailed expense categories were frequently missing. Thus, with regard to the development of measures of "management" efficiency, i.e., measures by which the companies manage their expenses, assets, or liabilities, the number of firms reporting a specifically useful item were often few in number. Moreover, the number of observations for a particular variable that was potentially useful in the analysis frequently dwindled to the point where its statistical reliability was seriously questioned. For example, in examining an initial model with 10 variables, with only 20 firms reporting values for all 10 variables, one is left with only 9 degrees of freedom and a general

inability to disentangle the effects of the independent variables from one another. Largely because of the difficulty in specifying equations with as many observations as possible, this analysis is focused on the two subsets as defined above.

Regression Analysis

The results of estimating the initial regression models wherein the list of independent variables in Table 5.10 are used as regressors is reported in Table 6.1. In this case, the set of observations pertained to all firms which reported employees' wages and interest expenses, which also reported boat slips. A total of 49 firms which did not have missing observations for any and all of the regressors was used in the model. In this and subsequent tables in this chapter attention is focused on the rate of return on sales and the rate of return on total assets. Although the equations explaining the rate of return on net worth are reported in these tables, their importance is minimized as per the discussion in Chapter 5 regarding the poor performance of this variable.

As shown in the table, the statistically significant variables with correct a priori signs in equation 6.1, which explain the variation in the rate of return on net sales [RETSALE1], are interest expense as a percentage of total expense and the Nashville dummy variable. In the case of equation 6.2, which explains the variation in the rate of return on total assets [RTASSET1], the statistically significant variables with correct a priori signs are interest expense as a percentage of total expense, project purpose navigation dummy variable, and the Nashville dummy variable. In the case of equation 6.3, which explains the variation in rate of return on net worth [RTNTWTH1], the statistically significant variables with correct a priori signs are interest expense, the year the project pool was filled, the ratio of current liabilities to net worth [which is probably significant due to some spurious correlation], and the Nashville dummy variable. In all three cases the initial results indicate the importance of debt management to the concessionaire's success as measured by the importance of interest expense.

TABLE 6.1

PRELIMINARY REGRESSION MODELS USING DATA SUBSET WHICH INCLUDES ALL FIRMS REPORTING INTEREST AND EMPLOYEE WAGE EXPENSES, PLUS BOAT SPACES[a] (n=49)

Independent Variables	Dependent Variables: RETSALE1 Eq. 6.1	RTASSET1 Eq. 6.2	RTNTWHTH1 Eq. 6.3
INTERCEPT	- .153	1.675	475.137+
	(42.595)[b]	(26.516)	(264.090)
CORPORAT	- 3.166	- 3.931	53.7314
	(6.051)	(3.767)	(37.516)
INTEXP	- 1.0765**	- 0.672	- 1.4388
	(0.634)	(0.395)	(3.933)
PERBOAT	0.1100	0.0295	6.4055**
	(0.450)	(0.280)	(2.788)
TSHORE	0.015	0.0150**	0.0717
	(0.010)	(0.006)	(0.061)
ACIDTEST	0.1232	- 0.0442	- 2.0557
	(0.634)	(0.169)	(1.682)
FLDCONTL	- 6.718	- 2.684	- 51.812
	(5.742)	(3.574)	(35.599)
NAVIGATN	- .574	- 8.4887**	- 51.403
	(7.800)	(4.856)	(48.363)
RLL	0.104	0.0573	0.4924
	(0.160)	(0.099)	(0.990)
RRENTU	0.015	0.0128	0.0942
	(0.013)	(0.008)	(0.083)
YEARFULL	0.023	- 0.0367	- 3.6003*
	(0.375)	(0.233)	(2.324)
WORKCAP	0.00005	- 0.00005	- 0.0019
	(0.0001)	(0.00007)	(0.0007)
CLIABNTW	0.633	0.8521	- 27.6367**
	(2.103)	(1.309)	(13.039)
NSGFA	- 0.0055	0.0106	0.1504
	(0.022)	(0.014)	(0.136)
NASHVILL	- 12.850+	- 7.3218**	- 78.1716+
	(7.369)	(4.587)	(45.686)
CONSRENT	- 0.0047	0.0084	- 4.2929
	(0.313)	(0.195)	(1.942)

TABLE 6.1 (Continued)

PRELIMINARY REGRESSION MODELS USING DATA SUBSET WHICH INCLUDES ALL FIRMS REPORTING INTEREST AND EMPLOYEE WAGE EXPENSES, PLUS BOAT SPACES[a] (n=49)

	Dependent Variables		
Independent Variables	RETSALE1 Eq. 6.1	RTASSET1 Eq. 6.2	RTNTWHTH1 Eq. 6.3
R^2	.381	.541	.539
$\bar{R}^2$	.100	.333	.329
F	1.354	2.584**	2.574**
Standard Error	16.771	10.440	103.981

[a]Significance level designations are given in Table 5.2.

[b]Figure in parentheses represents standard error of coefficient.

The existence of multicollinearity due to the large number of interrelated variables prevents any more meaningful tests of hypotheses regarding individual coefficients. An examination of the associated F statistic shows that in the case of equations explaining RTASSET1 and RTNTWTH1 the null hypothesis that the entire set of coefficients is jointly equal to zero can be rejected. An examination of the R^2 for all three equations shows the explanatory power of the RTASSET1 and RTNTWTH1 to be considerably higher than the corresponding power of RETSALE1. For future reference in comparing equations which differ in terms of their numbers of independent variables and observations, the adjusted R^2 (denoted as $\bar{R}^2$) has been calculated as well. As Johnston and other econometricians have pointed out, this summary measure is more relevant in comparison of models.[1]

An implication of the total shore line variable (TSHORE) in all estimated equations is that in a comparison of two firms located on different projects the firm located on the larger one in terms of shore line, ceteris paribus, will have associated higher rates of return on the profitability measures. The interpretation of the Nashville dummy variable (NASHVILL) indicates, ceteris paribus, that firms located in this Corps district will have lower profitability rates compared to firms in other districts. In addition, projects designed primarily for navigation purposes (NAVIGATN) have a detrimental effect on concessionaire profitability since the sign of the coefficient in this case is consistently negative. Finally, the number of recreational rental housing units for families (RRENTU) in the project is also related to the profitability measures, thus indicating the importance of project-based family accomodations in assuring profitable concessionaire operations.

To reiterate, the results presented in Table 6.1 represent the initial estimates of the regression models. Because much simpler models would be more useful for forecasting concessionaire financial

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[1] J. Johnston, Econometric Methods (New York: McGraw-Hill, second edition, 1972), pp. 129-39.

performance, the number of variables has been reduced in each of the three models. The decision to exclude specific variables from a particular model was made on the basis of those variables having incorrect signs, extremely low "t" values, and relatively low simple correlations (as reported in Chapter 5). As a result in all three models the final set of independent variables varied among the models. The results of re-estimating the models are presented in Tables 6.2 (firms reporting interest and wage expenses) and 6.3 (firms reporting interest and wage expenses, plus boat slips).

The results of the final regression models show slightly smaller R^2 statistics than the initial regression models but this is to be expected in any regression analysis. On the other hand, the adjusted $\bar{R}^2$ is higher than in the initial estimated models. In the case of the variables measuring rate of return on total assets and net worth, the regression equations explain approximately 45 to 53 per cent of the variability in these measures among the firms in the respective samples. While it would be ideal to have the ability to explain all of the variability in the dependent variables, it is impossible to do so--particularly in microeconomic studies where many random influences affect the individual firm. Furthermore, since the treatment of the managerial influences affecting profitability was deficient in this study there exists an additional inability to explain all of the variability in profitability due to the importance of such influences. At this point, however, one may be reasonably confident of the adequacy of the models derived.

As noted above, the results in Table 6.2 are based upon the subset of firms which reported interest and employee wage expenses, while those in Table 6.3 are based upon the subset which, in addition, reported boat spaces available for rent. As in the previous regression models, and based upon the conclusions drawn in the previous chapter, none of the final regression equations have included the market variables as explanatory variables. Although initial regressions were run which included several market variables, none of the market variables had the

TABLE 6.2

FINAL REGRESSION MODELS USING DATA SUBSET WHICH INCLUDES ALL FIRMS REPORTING INTEREST AND EMPLOYEE WAGE EXPENSES[a] (n=57)

	Dependent Variables		
Independent Variables	RETSALE1 Eq. 6.4	RTASSET1 Eq. 6.5	RTNTWTH1 Eq. 6.6
CONSTANT	0.434	2.225	-5.744
	(7.780)[b]	(10.872)	(109.480)
TSHORE	0.014**	0.012***	0.085**
	(0.007)	(0.005)	(0.047)
FLDCONTL	- 6.932*	- 3.453	- 33.310
	(4.220)	(2.963)	(30.772)
RLL	0.141	0.096	
	(0.116)	(0.082)	
RRENTU	0.011*	0.013**	0.083
	(0.008)	(0.006)	(0.067)
CORPORAT	- 1.867	- 3.407	22.215
	(4.062)	(2.995)	(31.443)
WORKCAP	0.000004	- 0.00007	- 0.002
	(0.00007)	(0.00006)	(0.001)
INTEXP	- 0.991***	- 0.708***	
	(0.374)	(0.259)	
NASHVILL	-12.416++	- 8.409++	- 79.188++
	(5.714)	(3.926)	(39.957)
NAVIGATN		- 6.253*	- 35.357
		(3.911)	(39.765)
YEARFULL		- 0.018	- 1.204
		(0.184)	(1.890)
NSGFA		0.012	0.139
		(0.012)	(0.118)
PERBOAT			3.824**
			(2.164)
CLIABNTW			- 33.870***
			(10.062)

TABLE 6.2 (Continued)

FINAL REGRESSION MODELS USING DATA SUBSET WHICH INCLUDES ALL FIRMS REPORTING INTEREST AND EMPLOYEE WAGE EXPENSES[a] (n=57)

	Dependent Variables		
Independent Variables	RETSALE1 Eq. 6.4	RTASSET1 Eq. 6.5	RTNTWTH1 Eq. 6.6
R^2	.374	.530	.440
$\bar{R}^2$	.270	.415	.303
F	3.587***	4.609***	3.208***
Standard Error	14.326	9.606	98.577

[a]Significance level designations are given in Table 5.2.

[b]Figure in parentheses represents standard error.

TABLE 6.3

FINAL REGRESSION MODELS USING DATA SUBSET WHICH INCLUDES ALL FIRMS REPORTING INTEREST AND EMPLOYEE WAGE EXPENSES, PLUS BOAT SPACES[a] (n=49)

	Dependent Variables		
Independent Variables	RETSALE1 Eq. 6.7	RTASSET1 Eq. 6.8	RTNTWTH1 Eq. 6.9
CONSTANT	- 0.016	0.307	- 7.189
	(8.613)	(12.110)	(128.500)
TSHORE	0.014**	0.013***	0.092**
	(0.008)	(0.005)	(0.057)
FLOCONTL	- 6.655*	- 2.210	- 37.907
	(4.928)	(0.508)	(36.138)
RLL	0.120	0.071	
	(0.133)	(0.089)	
RRENTU	0.013	0.015**	0.077
	(0.010)	(0.007)	(0.082)
CORPORAT	- 2.313	- 3.705	26.619
	(4.682)	(3.325)	(36.690)
INTEXP	- 0.961**	- 0.515**	
	(0.442)	(0.278)	
WORKCAP	0.00003		- 0.002
	(0.00008)		(0.0007)
NASHVILL	-11.292+	- 7.112+	- 78.323+
	(6.323)	(4.179)	(43.235)
NAVIGATN		- 5.961*	- 46.226
		(3.874)	(47.811)
YEARFULL		- 0.007	- 1.297
		(0.200)	(2.163)
NSGFA		0.008	0.151
		(0.012)	(0.134)
PERBOAT			3.884**
			(2.514)
CLIABNTW			- 33.098***
			(11.287)

TABLE 6.3 (Continued)

FINAL REGRESSION MODELS USING DATA SHEET WHICH INCLUDES ALL FIRMS REPORTING INTEREST AND EMPLOYEE WAGE EXPENSES, PLUS BOAT SPACES[a] (n=49)

	Dependent Variables		
Independent Variables	RETSALE1 Eq. 6.7	RTASSET1 Eq. 6.8	RTNTWTH1 Eq. 6.9
R^2	.370	.522	.445
$\bar{R}^2$	.183	.396	.280
F	2.943*	4.158***	2.695**
Standard Error	15.360	9.914	107.785

[a]Significance level designations are given in Table 5.2.

[b]Figure in parentheses represents standard error.

correct signs and, hence, were rejected from the models. It is recognized that the failure to include explanatory variables, which are important in explaining the variations in the dependent variables and which are correlated with included explanatory variables will lead to specification errors and biases in the estimates of the coefficients of the included explanatory variables. However, in this case it is felt that every possible attempt was made to minimize these biases.

An examination of the independent variables included in the final regressions shows that seven are project-related and six are firm-related. In Tables 6.2 and 6.3 the single most important explanatory variable in equations 6.4 and 6.5, and 6.7 and 6.8, respectively, is the interest expense variable (INTEXP) which measures interest expenses as a percentage of total expenses. While the interest expense variable was not significant in the rate of return on net worth equation (equations 6.6 and 6.9) and was thus not included in the final regression, another variable--the ratio of current liabilities to net worth (CLIABNTW)--discloses the same effect. In this latter case the variable enters the model with a negative coefficient, which again emphasizes the importance of debt management. The results for INTEXP and CLIABNTW emphasize the importance to profitable management of keeping debt and liabilities in line with the firm's ability to meet interest obligations on these debts while maintaining a profitable operation.

Among the other statistically significant variables in the list of independent variables were the total shoreline (TSHORE), flood control as a project purpose (FLDCONTL), navigation as a project purpose (NAVIGATN), and the number of family recreational rental units on the project (RRENTU). In addition, the Nashville district dummy variable (NASHVILL) is negative and significant. As a result of these findings it can be concluded that, on the basis of this sample, the purpose of the project and the number of family housing units, ceteris paribus, are associated with the relative profitability of concessionaires.

One of the firm variables of interest is the legal status of the concessionaire (CORPORAT). This variable takes on a value of one if the concessionaire is a corporation and a zero if it is either a proprietorship or a partnership. In all of the regression equations reported in Tables 6.2 and 6.3, this particular variable is negative but insignificant from zero. If the corporate form of organization implies lack of managerial control, then the negative sign on this variable would suggest that "absentee" ownership may be detrimental to profitable concession operations. This fact was mentioned several times in the interviews which were conducted with concessionaires and Corps district officials.

The working capital variable (WORKCAP) has a variety of signs in all of the equations but it is never statistically significant from zero since a positive sign was expected. This variable reflects liability management to a great extent and, as with the interest expense and current liability management variables, it reflects the firm's ability to adjust to changing sales and inventories, among other factors. Since it is a standard measurement of managerial efficiency, it was included in all the models.

A similar interpretation can be made of the net sales management variable (NSGFA), although it was not statistically significant from zero. The more efficient use a firm makes of its assets, which are in fact, the generators of profits, the more likely it is to have positive earnings. In other words, the higher the sales per unit of assets, the higher the profitability of the firm. Although in all regression models the expected positive sign was found for this coefficient, none were statistically significant from zero. As in the case of other managerial variables this variable was included in the final regression model in order to minimize the possibility of specification bias which would possibly occur if it were omitted. One other point should be mentioned in order to correctly interpret the results for this variable. It was noted in Chapter 4 that many unprofitable firms have a large

amount of funds tied up in non-earning assets such as land, sewage facilities, parking, etc. In these cases, the firm reports relatively high gross fixed assets but can, at the same time, have relatively low sales and profitability. The existence of several unprofitable firms in this situation could, in part, explain the statistical insignificance of this variable.

Finally, the age of the project as represented by the last two digits of the year completed (YEARFULL) is statistically insignificant but has the expected sign. This suggests that newer projects are less successful in attracting visitors and thus in providing the potential for profitable operations for concessionaires. Consequently, it was judged that older projects (being more established) can more readily attract visitors which enhance the potential profitability of concessionaires located on these projects. The variable measuring the percentage of boats rented was statistically significant only in the rate of return on net worth models and was not included in any other models since it was not associated with these variables in the simple correlation analysis.

An examination of the associated F statistics reported in Tables 6.2 and 6.3 indicates that in all six regressions, the null hypotheses that the entire set of coefficients is jointly equal to zero can be rejected. As in the initial model, the best fit is achieved for the rate of return on total assets variables and the worst for the rate of return on net sales. An examination of the adjusted $\bar{R}^2$ indicates these models explain relatively more variability than the initial models. Using these criteria, the most satisfactory model is equation 6.5 which explains the rate of return on total assets.

In developing these final regression models, other variables besides those reported in Tables 6.2 and 6.3 were experimented with as well. Many of these variables are related to other variables and therefore serve as proxies for the latter. Although the size of the estimated models could probably be further reduced by eliminating more of the independent variables, it was decided that these models would be utilized since they are, in the judgement of the researchers, the best ones attainable.

In summary, the estimated models in Tables 6.2 and 6.3 suggest the importance of firm and project variables in establishing the overall profitability of concessionaires located on Corps projects. The single most important variables are the interest expense and the total shoreline of the project. In addition, there exist other variables which affect the different profitability measures. There appear to be few differences in the models when estimated over the two subsets of the original 94 concessionaires. In the last part of this chapter various forms of these estimated regression models are used to forecast concessionaire profit rates for the new Raystown project.

Discriminant Analysis

The other statistical method utilized in this study to develop a model of concessionaire financial performance was discriminant analysis. This multivariate method has been recently used more extensively in economic research and has even begun to be incorporated into econometric methods textbooks.[2] In addition, several recent Corps of Engineers have used this method for analyzing traffic behavior between different transportation modes.[3]

In this section the principal ideas and problems underlying the use of discriminant analysis are developed first, followed by a discussion of its application to the firms in the two subsets which were examined in the previous section.

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[2]See the discussion of applications of discriminant analysis to economics and business in Robert A. Eisenbeis and Robert B. Avery, Discriminant Analysis and Classification Procedures (Lexington, Massachusetts: Lexington Books, 1972). One standard econometrics text which has a short discussion is J. Johnston, Econometric Methods (New York: McGraw-Hill, 1972), second edition.

[3]See Lloyd G. Antle and Richard W. Haynes, An Application of Discriminant Analysis to the Division of Traffic Between Modes, 1971, IWR 71-2 and U.S. Army Engineer Division, Southwestern, Dallas, Texas, Discriminant Analysis Applied to Commodity Shipments in the Arkansas River Area, 1972, IWR 74-R2.

Discriminant analysis deals with the analysis of groups of a population which, in this case, were profitable and unprofitable concessionaires at U.S. Army Corps of Engineer projects. According to Eisenbeis and Avery, the assumptions underlying the use of discriminant analysis are:

(1) the groups being investigated are discrete and identifiable,

(2) each observation in each group can be described by a set of measurements on m characteristics or variables, and

(3) these m variables are assumed to have a multivariate normal distribution in each population.[4]

In this analysis the two groups are both discrete and mutually exclusive with respect to a particular year of operation. The m characteristics which were examined are of the same types as in the previous section. As in that case market variables are not included as they have not shown the expected association with profit rates. In general the discriminant analyses presented below are based upon the same sets of characteristics as studied in the two sets of regressions in the previous section.

One can use discriminant analysis to test whether there are significant differences among select groups and, if found, to determine the sources and magnitudes of the differences among the groups. For example, one important factor which could affect the profitability or lack of profitability of a concessionaire is the length of time the project on which the concessionaire is located has been opened to the public.

Once such differences are found a second use of discriminant analysis is to develop classification schemes derived from the set of m variables in order to predict the group to which a previously unknown

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[4] Eisenbeis and Avery, op. cit., p. 1.

observation would be assigned. In regard to the problem at hand the use of such a classification scheme was proposed to determine whether or not a new concessionaire would be profitable or unprofitable at a particular project.

There are a number of potential problems which could be encountered in attempting to derive unique classification schemes in a particular application. First, the groups may not be distinct or mutually exclusive. However, as mentioned above, it was felt in this study that the two groups chosen are unique, distinct, and mutually exclusive.

Second, some of the m variables may not be normally multivariate in nature. A common type of variable which violates the assumption of multivariate normality is the dichotomous zero-one dummy variable. In the previous regression analysis there were a number of such variables included in the set of independent variables in one or more models, i.e., CORPORAT, NASHVILL, FLDCONTL, and NAVIGATN. Some studies cited by Eisenbeis and Avery indicate, however, that the use of dichotomous variables does not significantly bias the results.[5] These studies indicate that one must not include too many dichotomous variables relative to the other kinds of classification variables in a specific analysis. Consequently, in the discriminant analysis below an investigation of the sensitivity of the classification scheme to the above list of dichotomous variables was performed.

Third, a more damaging problem is created when the population dispersions are unequal and one uses a linear classification procedure in discriminant analysis. In such cases the tests of equality of the group means are biased, leading one to incorrect inferences about the uniqueness of the groups under investigation. The suggested procedure in these cases involves a test of the equality of the population dispersions among the groups examined and, if rejected, the use of quadratic classification rules.[6] In

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[5] Ibid., p. 37.

[6] Ibid., p. 37.

developing the discriminant function, these tests were performed at the ten per cent level and based upon the results either linear or quadratic classification rules were employed.

Fourth, in developing the classification rules the constant term (i.e., the cutoff) is dependent upon the a priori probabilities of the observations falling into the groups analyzed. One interesting result generated from the estimated discriminant function is the probability of misclassifying an observation. These probabilities are affected by errors in the a priori probabilities of an observation falling into the groups. Consequently, poorly chosen a priori probabilities will cause erroneous probabilities of misclassification. Experience has shown that variations in a priori probabilities are more damaging than some of the other problems discussed.[7] To minimize this problem the a priori probabilities chosen were first based upon the a priori probabilities of a firm being profitable or unprofitable in the sample and, second, the a priori probabilities of a firm being profitable or unprofitable at all Corps projects. In this way, the sensitivity of the classification results to the choice of a priori probabilities was established.

Fifth, the sample size can affect the significance tests for group mean differences. In this study, the maximum number of concessionaires examined was 94, which is certainly not a large sample compared to those used in other studies.[8]

These possible problems with discriminant analysis notwithstanding, it was next applied to the development of classification procedures for concessionaires at the Corps projects in the sample. Although the potential maximum number of concessionaires in the analysis is 94, in practice the sample consisted of less than 94 firms due to missing observations for some variables (as discussed in the previous section of this chapter).

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[7] Ibid., pp. 52-53.

[8] Ibid., pp. 53-57.

The categories into which the firms were classified are profitable (PROFIT1=1) or unprofitable (PROFIT1=0). Table 6.4 presents the results of applying discriminant analysis to firms reporting wage and interest expenses, plus boat spaces. The classification variables are the same as used in the first regression model (as reported in Table 6.1) and include the following; PERBOAT, TSHORE, FLOCONTL, NAVIGATN, RLL, RRENTU, YEARFULL, CONSRENT, CORPORAT, CLIABNTW, NSGFA, ACIDTEST, INTEXP, WORKCAP, and NASHVILL.

In this and subsequent analyses examined in this section, before constructing the discriminant function a Chi-square test of the homogeneity of the covariance matrices between the two groups was performed. If as a result of this test it was found that the covariance matrices were homogeneous between the two groups, the pooled covariance matrix (based on both groups) was used to develop the discriminant function. On the other hand, if the results of the test indicated the covariance matrices to be nonhomogeneous, then the individual covariance matrices were used to develop the classification rules.[9] The resulting classification procedure in this latter case is not linear in light of the discussion of the potential problems noted above. In all cases examined in this study, quadratic classification rules were used since the Chi-square test indicated nonhomegeneity of the covariance matrices between the profitable and unprofitable firms. Since the computer program did not generate the actual discriminant function we were unable to report it; however, we were able

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[9]For a discussion of this test see M.G. Kendall and A. Stuart, The Advanced Theory of Statistics, Volume 3 (London: Charles Griffin and Company, Itd., 1961), pp. 266-82.

TABLE 6.4

SUMMARY OF DISCRIMINANT ANALYSIS APPLIED TO INITIAL SET OF CLASSIFICATION VARIABLES[a]

Case	Classified from PROFIT1	Number of Observations Classified Into PROFIT1		Frequency of Occurence in Sample	A Priori Probability
		PROFIT1=0	PROFIT1=1		
I	PROFIT1=0	18	0	18	.6
	PROFIT1=1	1	30	31	.4
II	PROFIT1=0	18	0	18	.37
	PROFIT1=1	1	30	31	.63

[a]Classification variables include: PERBOAT, TSHORE, FLOCONTL, NAVIGATN, RLL, RRENTU, YEARFULL, CONSRENT, CORPORAT, CLIABNTW, NSGFA, ACIOTEST, INTEXP, WORKCAP, and NASHVILL.

to rise the function in our subsequent forecasts for the Raystown project.[10]

In Table 6.4, it is shown that the initial choices of a priori probabilities were either .6 or .4 (Case I), or .37 and .63 (Case II). The former set is based on an expectation across all concessionaires in 1973 of a .4 probability of operating at a profit. This pessimism regarding overall probabilities of profitability in this year is based upon the effects of adverse climatic conditions on Corps water-based concessionaires during 1973, which was a year of high water. This particular combination of a priori probabilities will be presented in the subsequent analyses also.

The latter set of a priori probabilities will vary with the sample size and simply represent the probabilities of operating profitably or unprofitably based on the sample.

Although previous discussion indicated that the probabilities of misclassifying an observation are sensitive to the a priori probabilities chosen in the analysis, it can be seen from Table 6.4 that they do not affect the number of misclassified firms. Only one firm was misclassified in the initial classification analysis and the error here was in classifying a profitable firm as unprofitable, which is a less serious error, when considered from the Corps perspective, than the error of classifying an

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[10]Since the usual assumption in discriminant analysis is homogeniety of the covariance matrices among categories, all of the computer softwave programs available during the course of this study routinely present estimates of the linear discriminant function. In cases where this assumption is violated such programs estimated the quadratic linear discriminant function, classified the individual observations into the various categories and forecasted the category of new observation. None of these programs, however, could provide us with estimates of this more generalized discriminant function. As a result, the discriminant analysis in this study cannot be used in forecast exercises for specific projects unless the original data is obtained from the authors. These data can be provided to interested parties upon request.

unprofitable firm as profitable. The success of the classification analysis at this stage is due in part to the small number of observations and the large number of classification variables.

The discriminant analysis was next applied to the reduced set of classification variables which were previously analyzed in the regression analysis in Tables 6.2 and 6.3. The classification variables used in this analysis consisted of two groups. The first group (designated Group I) included the following: TSHORE, FLDCONTL, NAVIGATN, RLL, RRENTU, CORPORAT, YEARFULL, NSGFA, INTEXP, WORKCAP, and NASHVILL. The second group is a subset of the first and consists of those independent variables found to be of greatest relative importance in the regression analysis. It consists of the following variables: TSHORE, FLDONTL, RLL, RRENTU, CORPORAT, WORKCAP, INTEXP, and NASHVILL. In both groups, dummy variables were included which may create problems of misclassification as discussed earlier in this section. However, the use of such variables was kept to a minimum, through inclusion only if they were statistically significant in the previous regression analysis.

The discriminant analysis was applied to two groups of firms. The first consists of all firms reporting wage and interest expenses while the second consists of the same firms if, in addition, they had reported boat spaces available. Consistent with previous practice the firms in the second group were termed marinas (although not consistent with the Corps definition). The differences in the number of observations among the tables is attributable to the deletion of observations for which there are missing values for at least one of the variables in the group.

As mentioned earlier, misclassification of a firm occurs when the firm is profitable and is classified by the classification rule into the unprofitable category or when the firm is unprofitable and is classified by the classification rule into the profitable category. Since the Corps is interested in minimizing concessionaire failure, it would be more concerned with minimizing the latter misclassification if it were to use this analysis for decision making purposes. An examination

of Table 6.5 shows that the error of misclassifying an essentially unprofitable firm is minimized using the data when the a priori probabilities are the sample probabilities. In other words, more misclassification occur when the a priori probability of profitability is .4 instead of a higher value. Relatively more misclassification errors were made for marinas than for all firms based on a comparison of the number of misclassifications relative to the entire number of firms classified.[11]

Similar results were found for the variables in Group I as reported in Table 6.6. The deletion of the three variables from Group I does not appear to have had an adverse effect on the number of firms misclassified. It is possible that the further deletion of variables may also lead to minimal increases in misclassification errors. However, several experiments along this line showed substantial increases in misclassification errors with further variables deletions.

In summary, the use of discriminant analysis allows one to determine a set of classification rules for the classification of observations into different classes. In the case examined in this section the firms were classified into profitable and unprofitable categories on the basis of their associated values for the classification variables examined. The best classification results were achieved when the a priori probabilities were the sample probabilities and the set of classification variables was eight in number. In this case the predominate classification error was the classification of a firm into the unprofitable category when in fact it was profitable. These results tend to confirm our use of the variables in the regression results.

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[11] It should be noted that these discriminant models were also estimated assuming [debt erroreously] homogeneity of the covariance matrices between the two categories. The estimated linear discriminant function in this case had twice as many classification errors as reported in the text.

TABLE 6.5

SUMMARY OF DISCRIMINANT ANALYSIS APPLIED TO FINAL SET OF CLASSIFICATION VARIABLES--GROUP I[a]

Case Number	Firm Type	Classified from PROFIT1	Number of Observations Classified into PROFIT1		Frequency of Occurance in Sample	Prior Probability
			PROFIT1=0	PROFIT1=1		
III	All Firms[b]	PROFIT1=0	31	2	33	.60
		PROFIT1=1	5	33	38	.40
IV	All Firms	PROFIT1=0	31	2	33	.46
		PROFIT1=1	4	34	38	.54
V	Marinas[c]	PROFIT1=0	28	0	28	.60
		PROFIT1=1	6	28	34	.40
VI	Marinas	PROFIT1=0	27	1	28	.45
		PROFIT1=1	4	30	34	.55

[a]Variables consist of the following: TSHORE, FLOCONTL, NAVIGATN, RLL, RRENTU, CORPORAT, YEARFULL, NSGFA, INTEXP, WORKCAP; NASHVILL.

[b]Includes firms reporting wage and interest expenses.

[c]Marinas are firms which reported boat spaces as well as wage and interest expense.

TABLE 6.6

SUMMARY OF DISCRIMINANT ANALYSIS APPLIED TO FINAL SET OF CLASSIFICATION VARIABLES--GROUP II[a]

Case Number	Firm Type	Classified from PROFIT1	Number of Observations Classified into PROFIT1		Frequency of Occurance in Sample	Prior Probability
			PROFIT1=0	PROFIT1=1		
VII	All Firms[b]	PROFIT1=0	31	2	33	.60
		PROFIT1=1	7	31	38	.40
VIII	All Firms	PROFIT1=0	31	2	33	.46
		PROFIT1=1	5	33	38	.54
IX	Marinas[c]	PROFIT1=0	27	1	28	.60
		PROFIT1=1	7	27	34	.40
X	Marinas	PROFIT1=0	25	3	28	.45
		PROFIT1=1	5	29	34	.55

[a]Variables consist of the following: TSHORE, FLDCONTL, RLL, RRENTU, CORPORAT, WORKCAP, INTEXP, NASHVILL.

[b]Includes firms reporting wage and interest expenses.

[c]Marinas are firms which reported boat spaces.

Forecasts of Profitability for Typical Concessionaire Located at the New Raystown Project

Thus far in this chapter we have derived some general conclusions regarding the principal factors affecting the success or failure of concessionaires located on Corps projects. As mentioned earlier we have not been able to explain all of the variability in the profitability of these enterprises, nor do we expect to fully explain this since there are a wide number of either quantifiable factors which affect success for which we had no data available or unquantifiable factors which affect success. Chief among these influences are managerial factors which are critical to the successful operation of most firms. However, conclusions derived from both our regression and discriminant analysis enables us to venture some conclusions regarding the potential profitability of concessionaires operating at Corps projects which were not included in our sample. Before presenting these conclusions it is necessary to briefly survey some key concepts in prediction and some of the possible problems with the specific approach used here.

The type of prediction made in this section involves an extrapolation beyond the confines of the sample used since the Raystown project was not one of those chosen for this study. Such an extrapolation can be hazardous if there exist unique operating arrangements and problems at this project which are not relevant to other projects and hence were not reflected in the models which were estimated earlier in this chapter. In addition, this prediction is ex ante since it is a pure prediction of the future profitability of a typical firm which has not even been established. Thus, the accuracy of the prediction can only be determined by either the concession being established or by the lack of interest of firms and individuals to the bid proposal process. It should be noted that a decision by the Corps not to establish a concession or to establish one under different arrangements than those surveyed in this study does not constitute a test of the accuracy of the predictions in this section. Thus, the accuracy of the prediction made here will be determined by the reaction of a free market to the specifications in the bid proposals.

The predictions made in this chapter are also conditional predictions in that they are made on the basis of a particular set of values of the independent variables in the regression and discriminant analyses. In particular, the sensitivity of our predictions is examined with respect to a realistic range of values of the independent variables. Such a sensitivity analysis enables the individual using the prediction to be a better judge of the resulting predictions. Finally, the predictions made in this chapter are predictions for an average or typical firm as inferred from our previous analysis. Consequently, it is not our intent nor is it possible to make a prediction for a specific firm.

The Raystown project was completed and reached its normal pool level in 1975. The total shoreline of the project is 110 miles and the principal purpose of the project is flood control and recreation. This information together with the assumed values of the specific independent variables in Table 6.7 constitute the values used in forecasting the firm's profitability. As a measure of the firm's profitability the rate of return on total assets is used. The assumed values of the independent variables are based upon the different assumed lifespans of the marina operations, different lodge sizes, and the associated financial characteristics of these typical firms from the Rovelstad study (Vol. II of this study). In all cases examined we also assumed that 11 per cent of the visitors would engage in boating and that the three constructed boat launch ramps would have a total of 9 launch lanes.[12]

Table 6.8 presents the forecast values of the rate of return on total assets based upon the two estimated regression models from Tables 6.2 and 6.3. An examination of the forecast values for all cases shows none to be positive and all to lie between -12.9 and -31.7 per cent. Consequently, it can be concluded that the average firm with the values of the independent variables assumed above would be highly unprofitable based upon our regression models.

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[12]This was based upon an average in the sample of about three lanes per ramp.

In constructing these forecasts it was noted that the most important component (in terms of its magnitude) of the forecasted rate of return on total assets was the interest expense variable. Most of the variability in the forecast returns can be attributed to the variability in the value of interest expense. In the Rovelstad study interest expense was expected to vary between 30.6 and 34.3 per cent of total expenses. In our statistical analysis of 94 firms interest expense varied between 0.0 and 25.8 per cent with a mean of 6.2 per cent. Thus, it might be concluded that our forecast is somewhat speculative since the predicted values of this independent variable lies far outside of the range of experience of the sample of 94 firms. This is in large part due to the difference in the interest rates for this financing compared to that existing in 1973 and to the differences in the amounts of equity provided by either shareholders or partners and proprietors in the Rovelstad analysis compared to the sample. If the concession which operates on the Raystown project can lower its interest expenses it will be able to obtain a much higher rate of return than that forecast. For example, if the most optimistic forecast thus far is used--case 7 (equation 6.8) for partnerships or proprietorships--and an interest expense of 20 per cent is assumed, the forecast rate of return is only-4.3 per cent. Unfortunately, this most optimistic forecast is still negative indicating an unprofitable venture.

In summary, it appears on the basis of our forecasts from the regression models that the average firm operating on the Raystown project would have a negative rate of return on total assets and would not be profitable. However, this conclusion is dependent upon the assumptions made above and can in actuality be much higher or lower based upon the managerial capability of the firm and specific attributes of the Raystown project which are not accounted for in our regression models.

It should be reiterated that the regression models presented in this study only account for 50 per cent of the variability of the rate of return on assets of the firms from which the model was

TABLE 6.7

ASSUMED VALUES OF FIRM FINANCIAL DATA BASED UPON ROVELSTAD STUDY OF RAYSTOWN PROJECT[a]

Case	Number of Years of Marina Operation	Recreation Rental Units	Marina Size Slips	WORKCAP Dollars	INTEXP Per Cent	NSGFA Per Cent
1	10	100	250	$48,455	30.6	36.6
2	20	100	250	48,455	33.4	36.6
3	10	100	350	63,410	31.4	37.5
4	20	100	350	63,410	34.3	37.5
5	10	100	450	76,571	31.2	39.3
6	20	100	450	76,571	34.3	39.3
7	10	200	250	48,455	30.6	36.6
8	20	200	250	48,455	33.4	36.6
9	10	200	350	63,410	31.4	37.5
10	20	200	350	63,410	34.3	37.5
11	10	200	450	76,571	31.2	39.3
12	20	200	450	76,571	34.3	39.3

[a]Source: Volume II of the study.

TABLE 6.8

FORECASTS OF RTASSET1 BY CASE[a]

	Forecast of RTASSET1 Based Upon Regression Equations			
	(Eq. 6.5)		(Eq. 6.8)	
Case	Corporation	Partnership or Proprietorship	Corporation	Partnership or Proprietorship
1	-27.1%	-23.7%	-18.1%	-14.4%
2	-29.1	-25.7	-19.5	-15.8
3	-24.3	-20.9	-18.5	-14.8
4	-30.8	-27.4	-20.0	-16.3
5	-29.5	-26.1	-18.3	-14.6
6	-31.7	-28.3	-19.9	-16.2
7	-25.8	-22.4	-16.6	-12.9
8	-27.8	-24.4	-18.0	-14.3
9	-23.0	-19.6	-17.0	-13.3
10	-29.5	-25.1	-18.5	-14.8
11	-28.2	-24.8	-16.9	-13.2
12	-30.4	-27.0	-18.5	-14.8

[a]Based upon values of independent variables in Table 6.7 and text.

derived. Given the standard error of the model and the great percentage of variability of the concessionaire behavior not captured in the variables of the regression model, it is not possible to speak dogmatically about potential profitability of any particular firm or proposed new recreation area. A large percentage of the decision making on these things is still left to the enlightened judgments of those involved.

The best of the discriminant models from Tables 6.5 and 6.6 were used to forecast the profitability or unprofitability of the concessionaire to be located upon the new Raystown project. The forecast values of the classification variables are listed in Table 6.7. The profitability forecasts using the classification criteria and forecast values of the classification variables are presented in Table 6.9.

The results from the discriminant analysis reviewed on a case-by-case basis indicate the most critical classification variable in predicting a profitable concessionaire was the number of recreational rental units on the project (which in this case were associated with the concessionaire). If the recreational rental units were 200, then the concessionaire in general (regardless of whether or not it was a marina) was classified (and hence forecasted) to be profitable; otherwise, the number of such units was 100 and the concessionaire was classified as being unprofitable.

This forecast was somewhat modified by the forecasts for marinas (case VI) suggesting that marina operations may still be unprofitable even if associated with the large size of recreational rental units.

A comparison of these results with the forecasts from the regression model shows a little more optimism for a profitable concession operation at the Raystown project; however, the discriminant forecast does not allow one to evaluate the return on such an investment relative to an alternative investment. Thus, even if the larger scale operation is profitable, it may not be comparable in relative profitability to alternative investments.

TABLE 6.9

FORECASTS OF PROFITABILITY BY CASE BASED UPON THE DISCRIMINANT MODEL

Forecast Case Number	Discriminant Case Number[a] IV	VI	VII	X
1	Unprofitable	Unprofitable	Unprofitable	Unprofitable
2	Unprofitable	Unprofitable	Unprofitable	Unprofitable
3	Unprofitable	Unprofitable	Unprofitable	Unprofitable
4	Unprofitable	Unprofitable	Unprofitable	Unprofitable
5	Unprofitable	Unprofitable	Unprofitable	Unprofitable
6	Unprofitable	Unprofitable	Unprofitable	Unprofitable
7	Profitable	Profitable	Profitable	Profitable
8	Profitable	Profitable	Profitable	Profitable
9	Profitable	Profitable	Profitable	Profitable
10	Profitable	Unprofitable	Profitable	Profitable
11	Profitable	Unprofitable	Profitable	Profitable
12	Unprofitable	Unprofitable	Profitable	Profitable

[a]Based upon discriminant cases from Tables 6.5 and 6.6. The forecast values of the respective classification variables are given in Table 6.7.

APPENDICES

APPENDIX A

SPECIFIC VARIABLES AND DESCRIPTIONS

The following variables were obtained from concessionaire statements.

Variable Name	Description
	Income Statement
GRSALES	Gross Receipt or Sales
NTSALES	Net Receipts or Sales (Net of Returns and Sales Tax Collections)
CGOODSLD	Cost of Goods Sold
INVBEGIN	Inventory at Beginnings of Year
PURCHASE	Merchandise Bought for Manufacture or Sale
INVEND	Inventory at End of Year
GRSPROFT	Gross Profit on Sales
TOTINCOM	Total Income
RENTOTAL	Total Rental Expense
DEPRECTN	Depreciation
WAGESEMP	Salaries and Wages of Employees
WAGESOFF	Compensation of Officers
CONTRACT	Contract Labor
INTEREST	Interest Expense
ADVERTIS	Advertising Expense
TOTALEXP	Total Expenses
NETPROF1	Net Profit or Loss Before Taxes Calculated From Adjusted Income Statement Which Allows for Costs of Goods Accounting
NETPROF2	Net Profit or Loss Before Taxes Reported on Original Income Statement
	Balance Sheet
TCURASST	Total Current Assets
GFASSETS	Gross Fixed Assets
ACCDEPRC	Accumulated Depreciation
DIASSETS	Depletable or Intangible Assets
ACCAMORT	Accumulated Amortization
OASSETS	Other Assets Includes Net Fixed Assets for Firms Not Reporting Gross Fixed Assets and Accumulated Depreciation

Variable Name	Description
TFASSETS	Total Fixed Assets
TASSETS	Total Assets (Current and Fixed)
TCURLIAB	Total Current Liabilities
STOKLOAN	Loans from Stockholders
TFIXLIAB	Total Fixed Liabilities
COMMONSK	Common Stock
CAPSURPL	Paid In or Capital Surplus
DIVIDEND	Dividends (Includes Withdrawals by Partners and Proprietors)
RETEARN	Retained Earnings
NETWORTH	Net Worth
TREASTCK	Cost of Treasury Stock
TOLIASTK	Total Liabilities and Stockholders Equity
NAME	Business Name
NCODE	Business Code
PROJNO	Project Code
YEAR	Last Digit of Fiscal Year
NONCAL	Noncalendar Fiscal Year = 1, Fiscal Year Less than One Year = 2, Otherwise = 0
ORG	Corporation = 1, Partnership = 2, Proprietorship = 3
CURRATIO	Ratio of Total Current Liabilities Relative to Total Current Assets
RETSALE1	Calculated Net Profit as a Percentage of Net Sales
RETSALE2	Reported Net Profit as a Percentage of Net Sales
RTASSET1	Calculated Net Profit as a Percentage of Total Assets
RTASSET2	Reported Net Profit as a Percentage of Total Assets
RTNTWTH1	Calculated Net Profit as a Percentage of Net Worth
RTNTWTH2	Reported Net Profit as a Percentage of Net Worth
PROFIT1	Equals 1 if Calculated Net Profit $\geq$ 0, Otherwise Equals Zero
PROFIT2	Equals 1 if Reported Net Profit $\geq$ 0, Otherwise Equals Zero
CORPORAT	Equals 1 if Org = Corporation, Otherwise Equals 0
ACIDTEST	Curratio Excluding Inventory From Total Current Assets
CLIABNTW	Ratio of Current Liabilities to Net Worth

Variable Name	Description
WORKCAP	Working Capital = Difference Between Current Assets and Current Liabilities
INVWKCAP	Ratio of Inventories to Working Capital
TMINTERN	Times Interest Earned -- Net Profits and Interest Divided by Interest
NTWTHLIB	Total Net Worth as Percentage of Total Liabilities
NSGFA	Net Sales as a Percentage of Total Fixed Assets
MSALGFA	Compensation of Officers as a Percentage of Total Fixed Assets
MSALNS	Compensation of Officers as a Percentage of Net Sales
INTNS	Interest Expense as a Percentage of Net Sales
ADVNS	Advertising Expense as a Percentage of Net Sales
WAGEXP	Salaries and Wages of Employees as a Percentage of Total Expenses
ADVEXP	Advertising Expense as a Percentage of Total Expense
INTEXP	Interest Expense as a Percentage of Total Expense

PROJECT SPECIFIC VARIABLES AND DESCRIPTIONS

The following variables were defined and obtained from the 1973 RRMS.

Variable Name	Description
PROJNAME	Project Name
PATNDJAN	Project Attendance Recreation Days of Use January; Other Months Feb, Mar, Apr, May, Jun, Jul, Aug, Sept, Oct, Nov, Dec, Total
TNORAREA	Total Number of Recreation Areas
TATNDRAR	Total Attendance at All Recreation Areas
TNOCRAR	Total Number of Corps Managed Recreation Areas
PPICNIC	Per Cent Picnic Recreation Use Patterns
PERCAMP	Per Cent Camper Recreation
PERSWIM	Per Cent Swimmer Recreation

Variable Name	Description
PWATRSKI	Per Cent Water Ski Recreation
PERBOAT	Per Cent Boaters Recreation
PSIGHTSE	Per Cent Sight-See Recreation
PERFISH	Per Cent Fishing Recreation
PEROTHER	Per Cent Other Recreation
AWFOUOPM	Average Weekend Family Day Use During Peak Month
AWFCAMP	Average Weekend Family Camping
TPLWAREA	Total Project Land and Water Area
TWTRA	Water Area at Average Recreation Pool Elevation
TLNDA	Land Area at Average Recreation Pool Elevation
TSHORE	Total Shoreline Miles at Average Rec Pool Elevation
MINPOOL	Minimum Pool Elevation
MAXPOOL	Maximum Pool Elevation
AVPOOL	Average Recreation Pool Elevation
DATEIMP	Date Impoundment Began (First Two Digits Month, Last Two Digits Year)
DATEFULL	Date Full Operations (First Two Digits Month, Last Two Digits Year)
PJSUMATT	Project Attendance During 3 Summer Months as a Percentage of Total Project Attendance
TATNOCRA	Total Attendance at Corps Managed Recreation Areas
FLDCONTL	Flood Control Authorized Project Purpose = 1, Otherwise = 0
NAVIGATN	Navigation Control Authorized Project Purpose = 1, Otherwise = 0
POWER	Power Control Authorized Project Purposes = 1, Otherwise = 0
IRRIGAT	Irrigation Control Authorized Project Purpose = 1, Otherwise = 0
POLABAT	Pollution Abatement Control Authorized Project Purpose = 1, Otherwise = 0
RECREAT	Recreation Control Authorized Project Purpose = 1, Otherwise = 0
FISHWAILD	Fish and Wildlife Management Control Authorized Project Purposes = 1, Otherwise = 0
WTRSPLY	Water Supply
YEARFULL	Last Two Digits of Year When Full Operations Began

Variable Name	Description
	SMSA Locations-Closest to Project First and Allows Up to 2 SMSA's
SMSA1	SMSA Name
RD1	Road Miles from SMSA
SMSA1POP	SMSA Population
	Total Number of Private Recreation Facilities
NOINPRID	Number of Individual Private Docks
NOCMPRID	Number of Community Private Docks
NOCOMBS	Number of Community Boats Served
NONTRNT	Number of Non-Transient Trailers
NOLNDO	Number of Landscape Outgrants
NOTHRFLT	Number of Other Floating Facilities
	Number of Recreation Areas at Corps Projects By Managing Agency and Day (D), Night (N), or Total (T)
CAREAD	Corps Area D
CAREAN	Corps Area N
CAREAT	Corps Area T
TAREAD	Total Area D
TAREAN	Total Area N
TAREAT	Total Area T
	All Recreation on Completed Project
RFPS	Family Picnic Sites
RFCS	Family Camp Sites
RGA	Group Areas
RLR	Launch Areas
RLL	Launch Lanes
RBS	Swimming Beachers
RBCH	Bath/Change Houses
RLU	Lodging Units--Lodges, Inns and Cabins
RRENTU	Rental Units
RCS	Car Spaces
RCTS	Car/Trailer Spaces
RRP	Roads Paved--Miles
RRU	Roads Unpaved--Miles
RHT	Hiking Trails--Feet
RPL	Parking Lots
MARINA	Equals One if Contype is Marina, Zero Otherwise

Variable Name	Description
VISITMKT	Visits at Recarea as Percentage of Visits at Corps Man Areas:
NASHVILL	Equals One if Firm Locating in Nashville District, Zero Otherwise
STLOUIS	Equals One if Firm Located in St. Louis District, Zero Otherwise
LITLROCK	One if Firm Located in Lt. Rock District, Zero Otherwise
PITTSBRGH	One if Firm Located in Pittsburgh District, Zero Otherwise
OMAHA	One if Firm Located in Omaha District, Zero Otherwise
FTWORTH	One if Firm Located in Ft. Worth District, Zero Otherwise
TULSA	One if Firm Located in Tulsa District, Zero Otherwise

The following variables were defined and obtained from the sources other than the RRMS. The data are based upon a 50 mile market area surrounding the project

HOUSHLDS	Number of Households in Market Area (Thousands) in 1973. Source - Sales Management 1974 Survey of Buying Power, July, 1975.
NET_EBI	Effective Buying Income Net in Market Area (Thousands of Dollars). Source - Sales Management, Ibid.
MED_EBI	Median of All County Median Effective Buying Incomes (Thousands of Dollars) in 1973. Source - Sales Management, Ibid.

Number of Households in Various Income Categories in 1973 Source - Sales Management, Ibid.

HH0-2999	Incomes from 0 to 2999
HH3-4999	Incomes from 3000 to 4999
HH5-7999	Incomes from 5000 to 7999
HH8-9999	Incomes from 8000 to 9999
H10-149	Incomes from 10000 to 14999
HH15-UP	Incomes from 15000 Up

TRS_1973	Total Retail Sales in 1973 (Thousands of Dollars) Source - Sales Management, Ibid.

Variable Name	Description
	Personal Income and Population Data, Source - U.S. Dept. of Commerce, Bureau of Economic Analyses
TPI_1969	Total Personal Income in 1969
TPI_1970	Total Personal Income in 1970
TPI_1971	Total Personal Income in 1971
TPI_1972	Total Personal Income in 1972
TPI_1973	Total Personal Income in 1973
POP_1969	Population in 1969
POP_1970	Population in 1970
POP_1971	Population in 1971
POP_1972	Population in 1972
POP_1973	Population in 1973
	The following are Market Per Capita Income Calculated by Summing County Total Personal Income and Dividing by Total Population Summed
CMEAN_69	Per Capita Income in 1969
CMEAN_70	Per Capita Income in 1970
CMEAN_71	Per Capita Income in 1971
CMEAN_72	Per Capita Income in 1972
CMEAN_73	Per Capita Income in 1973
	The following are the Median of the Individual County Per Capita Incomes
MDCNM_69	Median Per Capita Income in Market Area in 1969
MDCNM_70	Median Per Capita Income in Market Area in 1970
MDCNM_71	Median Per Capita Income in Market Area in 1971
MDCNM_72	Median Per Capita Income in Market Area in 1972
MDCNM_73	Median Per Capita Income in Market Area in 1973
HPC10UP	Per Cent of Households with Income Above Ten Thousands in 1973
HPC15UP	Per Cent of Households with Incomes Above Fifteen Thousand in 1973
CPOP23	Percentage Change in Population 1972-1973
CPOP13	Percentage Change in Population 1971-1973
CMEAN23	Percentage Change in Per Capita Income 1972-1973

Variable Name	Description
CMEAN13	Percentage Change in Per Capita Income 1971-1973
BOATREG	Boat Registrations in Market Area. Source - By Telephone from Individual States
WRANGE	Range of Water Fluctuations - March thru October, 1973 Source - Monthly Regulation Charts from Corps Districts
WTRVAR	Variance of Water Fluctuations - March thru October

RECREATION AREA VARIABLES AND DESCRIPTIONS

VISITMKT	Visitation at Recreation Area As a Percentage of Visitation at Corps Managed Areas
VISIT	Visitation at Recreation Area in Recreation Days
AREACRE	Area Average of Recreation Area
CAPIMPRV	Capital Improvement Expenditures in Dollars During 1973
OMEXPND	Operation and Maintenance Expenditures in Dollars During 1973
BTSPACE	Number of Concessionaire Boat Spaces
CONSRENT	Percentage of Concessionaire Boat Spaces Rented
CMORNEED	Additional Concessionaire Moorings Needed
CCAPIMP	Concessionaire's Total Capital Improvement in Dollars
BOATS	Equals 1 if BTSPACES Greater than Zero, Otherwise Equals Zero

APPENDIX B

CORPS LEASING POLICY

Introduction

Since 1970 the rental procedure for commercial concession leases on Corps projects has been the graduated rental system (GRS). Previous to the initiation of this system, Corps districts used the percentage formula systems (PFS).

Since the composition of the concessionaire's costs is one of the determinants of the profitability of the concessionaire, and since the Corp's rent for the concessionaire is in many respects not under the control of the concessionaire, it is important to examine how the Corps determines the rent for its commercial concession lessees. Furthermore, such an examination will also indicate more clearly the nature of the relationship between the Corps district office and the commercial concessionaire. This relationship, it turns out, is important in determining the profit potential of existing and proposed concessionaires and thus allows us to determine the degree to which public interest in recreational services is met at Corps projects.

Statement of Present Corps Policy

The present policy towards commercial concession lessees is clearly stated as follows in a real estate circular from the OCE:

> a. Our primary objective in leasing lands for commercial concession purposes is to obtain services and facilities to meet the public demand at reasonable charges. This purpose will be achieved only when the concessioner has an opportunity to make a profit.

> b. In view of the possible economic hardship on lessees of a too rapid buildup of concessions on a new project, any proposal for the initial development of several sites should be based upon a thorough investigation [viz., a market analysis] as to each location to insure that anticipated visitations to that area of the project will generate sufficient business for the concessioner to survive during the early years of project operation. Where some areas are proposed for initial development and others are deferred, all interested parties should be advised in the invitation that other sites are planned for subsequent development, indicating the locations and the planned services and facilities. Such information will alert them to the Government's plans, it being understood, however, that such plans are subject to change as circumstances warrant.[1]

In its attempt to achieve the goals set forth in the above policy the Corps has developed the GRS.

The Graduated Rental System

Definition of terms. To better understand the workings of the GRS it is necessary to define the terms which are used in the calculation of the lease payments. A major concession is a lease on project land where either the actual or projected gross fixed assets [GFA] or the gross income exceeds $75,000. A minor concession is one which has GFA gross income under $75,000. No allowance is made for the effects of inflation in pushing a firm from the minor category to the major category. The GRS is used for major concessionaires only.

GFA is based on the original cost of all structures and equipment within the area leased by the concessionaire and which are used for income production. These include

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[1]Department of the Army, Office of the Chief of Engineers, Circular No. 405-2-12, 16 March, 1970.

> . . .such items as the costs of wells, retaining walls, water pipelines, telephone and power lines, sewage treatment facilities, landscaping, land preparation, site plans, automotive equipment (if used full time), buildings (including trailer or cottage for security personnel), and rented property used in the operation, and other items normally allowed by the Internal Revenue Service in a depreciation schedule. These items may include those furnished by sub-leases or income producing facilities furnished by the Government. Where such facilities are furnished by the Government, the fair market rental value thereof will be charged....Costs incurred by the concessioner to build access roads, parking areas, and ramps, to build breakwater or dredge harbors may be included in the GFA, but where such items are furnished by the Government they will not be so included, and no rental charge therefor will be made.[2]

Gross income represents the total receipts for the concessionaire from the business operation on the leased property and includes receipts of all subleases and licenses. License fees and taxes collected from customers for direct remission to tax authorities are not included. This is the major justification for using net income in our analysis of the concessionaire income statements. Gross income is divided into income from sales and income from rents and services.

Operation of GRS. The Corps has established that a concessionaire will reach a break-even point (no profit or loss) when gross income from rents and services is 30 per cent of GFA and when gross income from sales is 70 per cent of GFA. A composite break-even point is established for most concessionaires by weighting their break-even point percentage by the respective percentage of the firm's income. For the two income categories the Corps has established that the concessionaire can afford to pay a base rate as

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[2] Ibid., p. 5.

rent: the percentage of sales is 1.5 per cent and of rents and services is 4.5 per cent. A composite base rate is established by weighting these rates by the respective percentage of the firm's income in the category.

The Corps thus takes the firm's composite break-even point and multiplies it times the firm's GFA. This dollar amount is then multiplied by the composite base rate. If the break-even point is less than $54,000, then 50 per cent of the composite base rate is used; if it is greater than $54,000, then 150 per cent of the composite base rate is used.

Alegbraically, the following formulas apply.

K = Gross Fixed Assets

Y = Gross Income = S+RS

S = Gross Income from Sales

RS = Gross Income from Rents and Services

LR = Lease Rental

CBEP = Composite Break-even = ([S/Y] [.7] + [RS/Y] [.3]) Y

CBR = 1.5 S/Y + 4.5 RS/Y = Composite Base Rate

Rent = 0.5CBR [CBEP] + 1.5CBR [Y-CBEP]

In addition, if revenue exceeds twice the break-even point, the balance of income rate is levied at 3 per cent for sales and 7 per cent for rents and services.

The rent which is levied on the concessionaire depends upon the valuation of GFA, the amount of gross income, the predetermined break-even points for the two income categories, the magnitude of the composite base rate, and the 50-150 per cent and balance of income features.

Determination of Lessee and Services

In general, the proposed leasing site is determined to be available, based upon some approved Public Use or Master Plan. For each potential commercial concession site the District Engineer determines the services and facilities necessary to supply the present and future demands of the public. This determination is to be made after establishing the potential profitability of such an enterprise. According to Corps policy, public visitation to the area and use of the facilities and services must be established together with the potential profitability within the terms of the lease. In theory, this means that Corps district offices should engage in the type of market analysis which the previously-mentioned St. Louis Study recommended.

Once the district office has specified in detail the initial and ultimate development and construction of facilities which will be required, then it will be determined whether the concession required is major or minor. If it is determined to be major, then invitations for proposals are solicited involving the graduated rental systems. The proposals will clearly state the facilities and services required. Additional facilities may be provided depending upon "first, whether they are reasonably related to water based recreation, and second, whether the concessioner can reasonably expect to recover his investment during the remaining lease term."[3]

If the proposed concession is designated a minor one, then the invitation for bids will state the facilities and services required together with any specified standards of equipment. The lessee is limited with regard to business activity to that specified in the invitation for bids; but later amendments can be made. The rental system to be used is the appraised fair market rent (using the GRA as a guide).

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[3] Ibid., p. 7.

The award of bids for a concession where the estimated GFA and gross income are below $25,000 is made to the bidder offering the highest fixed annual rental if he is also the highest qualified bidder as determined by the District Engineer. The award of a lease based upon the proposals in all other instances is made on the basis of the offeror "who is determined by the District Engineer to be the most qualified, financially, by virtue of experience, character and otherwise, to provide the needed facilities and services."[4]

In actual practice, as documented in the St. Louis Study, the awards are often made to the only one offeror making the proposal or through the active encouragement of proposals from particular parties. In these instances one might expect that the specifications outlined in the invitations proposals are unprofitable to potential entrepreneurs. This was found to be the case in our experience in talking with Corps district officials who indicated that many of the facilities which the concessionaire was required to provide and which would comprise part of the GFA of the concession were not income-producing and were, hence, unprofitable [such as parking lots and sewage and water treatment facilities].

For major concessions, the rent is presently based upon the GRS and payments are to be made monthly during the peak recreation seasons and quarterly at other times. These are determined to be fixed minimum rentals (FMR) which a major concessionaire must pay.[5] For minor concessionaires, the rental payment will be a fixed sum and shall not be less than $100 per annum. Allowance is made for the phase-in of rent payments for beginning minor concessionaires.

The lessee is "not" permitted to make a charge for entrance or admission to the concession area, including that portion, if any, outside the project boundaries.

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[4] Ibid., p. 8.

[5] Ibid., p. 9.

The term of the lease is generally between 10 and 25 years so that the lessee can obtain a necessary return on his investment. Guidelines are provided by the Corps in establishing the term of the lease with the maximum allowable time period being 30 years (as required by OMB). No options for renewal are provided in the leases. The lessee is required to provide minimum liability insurance in the operations. Revocation of the lease is made only in instances where the lessee violates the terms of the lease and persists in violation for 90 days after the District Engineer has provided written notice of the violations.

The Corps reserves the right to approve the schedule of prices charged at the concessionaire and requires that changes in this schedule be made to the appropriate district office prior to the price changes going into effect. In a number of recorded instances, district offices provided written requests for price rollbacks when it was established that the concessionaires were selling goods (particularly gasoline) at prices above those on file.

APPENDIX C

TELEPHONE SURVEY

As part of this study, a telephone interview was made with a large number of the concessionaire owners throughout the United States, and with Real Estate Directors at those Corps Districts included in the study. The survey was conducted in an attempt to understand the present methods used by Corps offices for attracting and keeping concessionaires, and to help in the specification of the statistical model.

It was not the intent of the survey to develop a highly detailed series of responses because of the limited time in which the survey was completed and because specific financial information was already available from most of the concessionaires included in the analysis. As a rule, the results provided some insights into the operations of the marinas which could not be determined from the income or balance sheet data. And, in this sense, the informations was useful for introducing into the model items which would not normally have been used, one of the more specific of these being the water fluctuation variable.

It was learned from District personnel that no consistent method is followed in attracting proposals from potential concessionaire owners. Some Districts attempt to make a market determination for potential lessees and others do not. There are no fixed rules with respect to the number of boat slips required on a total project, nor the market to be served by each concessionaire. One of the difficulties discovered throughout the study is that related to distinguishing the total market for the project from that for each recreation area, as was discussed earlier with respect to the delineation of the market of 50 miles. What the Corps apparently tries to do is to assign market shares to each concessionaire from the total market; however, the total market itself is a very illusive and undetermined quantum.

In evaluating proposals, the Corps Districts try to pick the most "experienced" persons to run the concessionaire. While the lack of experienced mangement

is certainly a major problem with many of the operations, and this was also noted in previous studies of the industry (see the SBA study), from our survey it is apparent that there is no way to measure this item clearly.

RESULTS OF SURVEY

It was intended that interviews be conducted with the 15 most profitable and 15 most unprofitable concessionaires in the study. Moreover, an attempt was made to interview 10 concessionaires which moved into the profitable category between 1971 and 1973, the later year being the target year of the study. A number of concessionaires were also visited and personal interviews were held with each of these owners at their concession location.

Because of the passage of time, considerable difficulty was incurred when trying to reach many of the listed owners, or finding someone who had sufficient knowledge about the operations to answer questions. As a consequence only about 35 useful concessionaire interviews were made, including those on-site. The results, in general, are summarized below.

1. Length of ownership. As a rule, profitable owners (hereafter referred to as P), had operated their establishments longer than unprofitable ones (hereafter referred to as UP), and their concessions were much older than those losing money. However, this is reasonable since UP operations presumably tend to leave business after several bad years.

2. Background of management. The previous work experience of concessionaire owners is equally varied between the P group and the UP group. In fact, the professions of both groups could be classified as unrelated to running a marina or a business. And, in general, the reasons for entering into the marina business are equally varied and unrelated to profit motives. The most frequent reason given for going into the marina business for either group was related to the desire to be outdoors or some other similar

reason. Several concessionaires admitted that making profits was of little concern to them by making such non-pecuniary responses as needed a tax write-off, inherited the business, or were retired. Related to these responses apparently few of the concessionaire owners have had accounting or financial experience other than that associated with their varied backgrounds, although they were not questioned further on this matter.

3. Sales trend. Since the focus of the study was 1973, a number of concessionaires have had reversals in their profits and sales since 1973. More of the UP firms now have sales growth greater than 10 per cent per year than among the P group. Moreover, about five of the UP group blamed their poor 1973 experience on bad weather and their present profit position has improved.

4. Advertising. Both groups advertise locally and in nearby markets and use a variety of outlets. No significant differences appeared between the groups on this item.

5. Major problems. Whenever a major problem was mentioned by either group, it usually involved the weather or lake fluctuations at the project. Moreover, this problem is more serious for the UP group and those making the transitions from UP status to P status. About 15 of the 35 concessionaires interviewed claimed fluctuating water as a "major" problem for them. And five more indicated it was a "minor" problem. As a result of this response, water fluctuating measures were introduced into the statistical analysis.

6. Relationship with Corps. Only two concessionaires of the 35 expressed discontent with the Corps and the running of the concessionaire. Where comments were made, they concerned the lack of negotiation over operations of the concession and prices, etc.

7. Competition of projects. Only two concessionaires felt there was too much competition on the projects. Most also believed the rents were agreeable. However, only eight of the 35 felt their locations were ideal, and many thought they were not located close enough to roads, campsites, restaurants, etc.

However, the P group did not seem to be surrounded by more campsites, etc. than the Up group.

8. Market served. As a rule, most concessionaires seem to know from where their business comes. However, about 12 of the total felt they served a market of greater than 50 miles, but the rest (both groups) believed they served a nearby market, i.e., 50 miles or less. Since most of these are marinas, it makes sense that their markets would be restricted. As a rule, also, where a major lodge existed nearby, the markets served were stated as being very large, 200 to 300 miles. This was especially true for large Corps projects as well, such as those in Kentucky.

SUMMARY

In general, there is nothing significantly different about the P group that would explain its profitable operations compared with the UP group. Although the weather and water problems in 1973 may have been significant ones, they would apparently have disappeared over time. While the interviews provided some information about operations of the various groups of concessionaires, they did not, in any sense, provide a "key to success." Moreover, the model and statistical analysis show, the marinas studied are small businesses subject to a myriad of influences and management philosphies. Further, in so far as consistent underlying patterns of behavior are discernible, they are captured in the model. Much of the information derived from the interviews is reflected in the model as well.

APPENDIX D

SIMPLE CORRELATIONS BETWEEN DEPENDENT AND INDEPENDENT VARIABLES

This appendix examines the simple correlations between the dependent and independent variables. The results of this study are used to determine the reduced set of independent variables listed in Table 5.10 which are used in the subsequent regression and discriminant analyses.

Table D.1 presents the correlations for the set of variables representing market forces affecting the demand for recreational services in the 50-mile market area surrounding the individual firm. It should be keep in mind that the 94 different firms were located at 34 different corps projects and, consequently, there exists a number of observations which have the same values for the market variables. In the discussion summarized in Table 5.1; it was noted that there should be a positive relationship between these measures of demand and the relative measures of profitability. This expectation was not confirmed based upon an analysis of the simple correlations. None were statistically significant at conventional significance levels, and most had unexpected negative correlations with the three dependent variables.

One possible explanation for this total lack of positive association between the market variables and the profitability measure is the minimal variation in the independent variables relative to the variation in the dependent variables. Since there are only 34 unique markets and 94 unique firms, according to this argument, there is not enough variation in market characteristics to be associated with the variation in the firms' profitability measures. In order to determine if this was the explanation for the unexpected association, a sample of 29 representative firms which were located in 29 different markets was selected and the simple correlations between the market variables and the profitability measures were recalculated. These results are

TABLE D.1

SIMPLE CORRELATIONS[a] BETWEEN DEPENDENT VARIABLES AND MARKET INDEPENDENT VARIABLES (n=94 OBSERVATIONS)

Independent Variables	RETSALE1	RTASSET1	RTNTWTH1
HOUSHLDS	-0.024	-0.105	-0.064
NET_EBI	-0.024	-0.109	-0.064
TRS_1973	-0.029	-0.113	-0.068
CMEAN_73	-0.177	-0.351	-0.039
TPI_1973	-0.032	-0.122	-0.066
POP_1973	-0.026	-0.108	-0.066
HPC10UP	-0.144	-0.289	-0.045
HPC15UP	-0.132	-0.271	-0.043
CPOP23	-0.056	-0.108	-0.006
CPOP13	-0.067	-0.074	-0.011
CMEAN23	0.032	0.008	0.028
CMEAN13	0.015	-0.024	0.027
BOATREG	-0.134	-0.186	-0.056

[a]Significance level designations given in Table 5.2; however, in this case none of the simple correlations between variables was significant.

reported in Table D.2. As in the previous table, there exists no positive or statistical significance association between the two sets of variables. Thus, this explanation is inadequate to explain these contrary results.

One other possible explanation relates back to the basic structural model underlying our analysis. The market demand for recreational services should determine the quantity of recreational services purchased in the market. Structural equations relating the individual firm's market share to its supply of recreational services and the market demand should lead to an expectation of a relationship between the quantity of recreational services supplied by the firm and the general market demand, not as directly to the profit rates. Accordingly, the simple correlations between the firms net sales and the basic set of market variables were examined. These are reported in Table D.3. As can be observed, there exists no significant positive correlation between the market variables and the individual firms net sales in this case as well. Consequently, there exists no evidence based upon this sample of 94 firms of any simple association between general market demand characteristics and either profitability measures or net sales. Thus, in our subsequent model presented in this paper, none of the general variables were included in the list of explanatory variables.[4]

As examination of the simple correlations between the project variables and the profitability measures showed more encouraging results, as reported in Table D.4. First, none of the correlations with the rate of return on net worth were statistically significant with the correct sign, as expected from Table 5.1. Second, in the case of the rate of return on net sales, there appeared to be positive associations between this variable and the following variables: the percentage of visitors boating, the

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[4] In the subsequent regression analysis, various of these market variables were included as independent variables. The signs obtained for the estimated coefficients, however, were contrary to our expectation. Consequently, these variables were not included in the results reported later.

TABLE D.2

SIMPLE CORRELATIONS[a] BETWEEN DEPENDENT VARIABLES AND MARKET INDEPENDENT VARIABLES, 29 SELECTED FIRMS

Independent Variables	Dependent Variables RETSALE1	RTASSET1	RTNTWTH1	Number of Observations
HOUSHLDS	-0.187	-0.245	0.130	29
NET_EBI	-0.205	-0.261	0.139	29
TRS_1973	-0.197	-0.249	0.161	29
CMEAN_73	-0.436	-0.403	0.091	29
TPI_1973	-0.220	-0.279	0.116	29
POP_1973	-0.119	-0.257	0.118	29
HPC10UP	-0.388	-0.393	0.157	29
HPC15UP	-0.367	-0.359	0.185	29
CPOP23	-0.161	-0.269	-0.060	29
CPOP13	-0.112	-0.216	-0.962	29
CMEAN23	-0.023	0.078	-0.169	29
CMEAN13	-0.079	0.037	0.001	29
BOATREG	-0.150	-0.188	0.192	29

[a]Significance level designations given in Table 5.2; however, in this case none of the simple correlations between variables was significant.

TABLE D.3

SIMPLE CORRELATIONS[a] BETWEEN NTSALES AND MARKET SPECIFIC INDEPENDENT VARIABLES

Independent Variables	Correlation with NTSALES	Number of Observations
HOUSHLDS	0.018	94
NET_EBI	0.021	94
TRS_1973	0.034	94
CMEAN_73	0.023	94
TPI_1973	0.028	94
POP_1973	0.022	94
HPC10UP	0.027	94
HPC15UP	0.033	94
CPOP23	-0.183	94
CPOP13	-0.147	94
CMEAN23	0.047	94
CMEAN13	0.012	94
BOATREG	-0.115	94

[a]Significance level designations given in Table 5.2; however, in this case none of the simple correlations between variables was significant.

total shoreline of the project which is possible as a measure of the number of coves, the number of boat launch areas, and the number of rental units on the project. Negative associations existed for no variables in the case of the rate of return on net sales. Third, in the case of the rate of return on total assets, there appeared to be positive associations between this variable and the same variables as in the case of the rate of return on net sales as well as the number of boat launch lanes. In addition, there existed negative associations with the following variables: purpose of project (flood control or navigation), and the year in which the project was completed. In all cases, the degree of association was higher for the rate of return on total assets than for the rate of return on net sales. The aforementioned variables are examined below in the development of our forecasting model of firm profitability.

The simple correlations between the firm variables and the profitability measures are reported in Table D.5. First as in the previous table, there are more statistically significant correlations with the rate of return on total assets than with the other two profitability measures. In the case of this profitability measure there were positive associations between this variable and the following variables: the percentage of concessionaire boat spaces rented, working capital, and net sales as a percentage of total fixed assets. Negative associations existed for the following variables: whether or not the firm was a marina (under Corps definition) and/or corporation, current ratio excluding inventories, ratio of current liabilities to net worth, compensation of officers as a percentage of net sales, and interest expense as a percentage of total expenses.

Second, in the case of the rate of return on net sales there were positive associations between this variable and the following variables: net sales as a percentage of total fixed assets and salaries and working capital. There was a negative association with interest expense as a percentage of total expenses, corporation, and compensation of officers as a percentage of net sales.

TABLE D.4

SIMPLE CORRELATIONS[a] BETWEEN DEPENDENT VARIABLES AND PROJECT INDEPENDENT VARIABLES (n=94 OBSERVATIONS)

Independent Variables	Dependent Variables RETSALE1	RTASSET1	RTNTWTH1
TATNDCRA	-0.013	-0.097	0.014
PWATRSKI	0.060	0.046	0.084
PERBOAT	0.147*	0.159*	-0.017
PERFISH	0.084	-0.020	0.059
AWFOUDPM	0.121	0.114	0.050
TWTRA	0.089	0.085	0.079
TSHORE	0.199**	0.298***	-0.020
PJSUMATT	0.041	0.089	0.042
FLDCONTL	-0.036	-0.135*	0.080
POWER	-0.036	0.061	0.080
NAVIGATN	-0.009	-0.140*	-0.090
IRRIGATN	-0.054	-0.132	-0.024
RECREAT	-0.148	-0.206	-0.100
FISHWILD	-0.034	-0.115	-0.073
WRTSPLY	0.002	-0.107	0.002
RLL	0.133	0.247***	0.016
RLR	0.136*	0.225**	-0.047
RRENTU	0.226**	0.405***	-0.037
YEARFULL	-0.094	-0.330**	0.132
WRANGE	0.104	0.221	0.004
WTRVAR	0.146	0.251	0.001

[a]Significant level designations given in Table 5.2.

TABLE D.5

SIMPLE CORRELATIONS[a] BETWEEN DEPENDENT VARIABLES AND FIRM INDEPENDENT VARIABLES

Independent Variables	Dependent Variables RETSALE1	RTASSET1	RTNTWTH1	Number of Observations
VISIT	-0.113	-0.191	-0.033	89
VISITMKT	-0.098	-0.176	-0.046	89
BTSPACE	-0.113	0.008	-0.112	85
CONSRENT	0.071	0.198**	0.071	85
CMORNEED	0.005	-0.040	0.012	86
MARINA	-0.100	-0.222++	0.049	94
CORPORAT	-0.138+	-0.252+++	0.087	94
CURRATIO	-0.090	-0.091	0.107	93
ACIDTEST	-0.101	-0.177*	0.153	91
CLIABNTW	-0.102	-0.190*	-0.358***	80
WORKCAP	0.440***	0.257***	-0.001	94
NTWTHLIB	0.082	0.096	-0.028	94
NSGFA	0.167	0.215**	-0.016	94
MSALNS	-0.610***	-0.491**	-0.135	29
INTEXP	-0.319***	-0.470**	0.078	75
ADVEXP	-0.045	-0.013	0.076	76
WAGEXP	0.053	0.052	0.123	84

[a]Significance level designations given in Table 5.2.

Third, in the case of the rate of return on net worth there was a positive association between this variable and net sales as a percentage of total fixed assets. A negative association was found between the ratio of current liabilities and net worth.

Fourth, none of the individual firm measures of local demand or product supply were associated with the profitability measures. In part this may be due to the a priori expectation of an association between these variables and net sales and the swamping of any association between these variables and the profitability measures due to the importance of costs in determining the reported profit rates. Simple correlations between the firm independent variables and NTSALES are reported in Table D.6. The most striking association reported in this table, which was not present in Table D.5, is the positive association of net sales with the visitation at the recreation area in recreation days, this visitation as a percentage of visitation at Corps managed areas, and the number of concessionaire boat spaces. Consequently, local demand in terms of visitations and market penetration on the project and the supply of boats are associated with the net sales of the individual concessionaire but are not associated with the profitability measures.

An examination of the simple correlations between the district dummy variables and the profitability measures are shown in Table D.7. Only in the case of the rate of return on total assets is there an indication of any association with a district, in this case the Nashville district. Although the simple correlations generally do not show much association of the effects on these dummy variables in our subsequent regression models.

In this appendix, an examination was made of the simple correlations between the initial sets of independent variables and the profitability measures. In general the rate of return on total assets had the greatest association with the set as a whole, followed by the rate of return on net sales and, lastly, by the rate of return on net worth. Review of the important associations led to the selection of a preliminary set of independent variables to be used in the regression models and discriminant functions. This list is presented in Table 5.3 in Chapter 5.

TABLE D.6

SIMPLE CORRELATIONS[a] BETWEEN NTSALES AND FIRM INDEPENDENT VARIABLES

Independent Variables	Correlation with NTSALES	Number of Observations
VISIT	0.271**	89
VISITMKT	0.179*	89
BTSPACE	0.367***	85
CONSRENT	0.114	85
CMORNEED	0.404***	86
MARINA	-0.068	94
CORPORAT	0.237+++	94
CURRATIO	-0.013	93
ACIDTEST	0.021	91
CLIABNTW	0.059	80
WORKCAP	-0.244	94
NTWTHLIB	-0.093	94
NSGFA	0.227**	94
MSALNS	-0.301	29
INTEXP	-0.059	75
ADVEXP	0.158	76
WAGEXP	0.082	84

[a]Significant level designations given in Table 5.2.

TABLE 0.7

SIMPLE CORRELATION BETWEEN DEPENDENT VARIABLES AND CORPS DISTRICT INDEPENDENT VARIABLES (n=94 OBSERVATIONS)

Independent Variables	Dependent Variables RETSALE1	RTASSET1	RTNTWTH1
NASHVILL	0.092	0.236++	-0.097
STLOUIS	-0.054	-0.120	-0.086
LITLROCK	-0.116	-0.157	0.121
PITTSBGH	0.003	-0.046	-0.013
OMAHA	-0.014	-0.063	-0.025
FTWORTH	-0.002	-0.037	0.047
TULSA	0.088	0.061	-0.024

Significant level designations given in Table 5.2.

APPENDIX E

SUMMARY OF METHODOLOGY

The methodology employed in the study is summarized here with particular attention to market delineation, data collection and standardization, and the statistical techniques used.

The three major types of data used in this research were those collected directly from the annual income statements and balance sheets of each concessionaire in the sample, from standard economic sources, and from the Corps RRMS. Actually, the income and balance sheet reports were received from many more Corps district concessionaires than were included in the final sample. The typical income and balance sheets received from concessionaires were very incomplete; and many of those received were so incomplete or difficult to interpret that these firms were not included in the sample. A great variety of accounting techniques was used by the firms. Where possible all income and balance sheet data were transferred onto standard sheets and keypunched. Many judgmental decisions were made with respect to items on each report and it would not be an exaggeration to state that every form received required some adjustment before the data were useful in the study.

All of the company variables used in the analysis were derived from the information summarized in the income and balance sheet reports. Complete sets of data for 1973 were obtained for 94 concessionaires from a total received of approximately 217. Unfortunately, the Sacramento District and Huntington District data were received too late to be included in the analysis, and the Huntington data were unidentifiable by concessionaire and project as well. Concessionaire data were rounded to the nearest thousand dollars.

Market Data

To determine market variables each project was assumed to serve a market of 50 miles. By way of

illustration, the market for Beaver Lake [Little Rock District] included the following counties:

ARKANSAS	MISSOURI
Benton	Barry
Boone	Christian
Carroll	Lawrence
Crawford	McDonald
Franklin	Newton
Johnson	Stone
Madison	Taney
Newton	
Washington	

This particular market represents one of the smallest in the study. The following information was collected for each county for the years 1969 through 1973 [the latest year for which data were available]:[1]

1. Total personal income
2. Population
3. Per capital personal income
4. Total households
5. Effective buying income per household [calculated by Sales Management Magazine]
6. Distribution of income by various income groups
7. Total retail sales
8. Total boat registrations [a breakdown of this data was not possible for most counties]

Project Data

All available project and recreation area data published by the Corps [OCE] in the RRMS were included.

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[1]The precise source of the data is given in Appendix A, where a list of variables is presented. Employment categories were available late in the study from the U.S. Department of Commerce Bureau of Economic Analysis, but could not be effectively used since it was too late to incorporate them into the data sets already on computer tape. Moreover, there was a storage problem with many of the subsets of data and many items had to be eventually dropped from the analysis after preliminary tests showed them to either be insignificantly related to the rate of return measures or of so few observations that they were statistically invalid.

Subsets of Data

Many subsets of data were created to complete the analysis. For example, 84 of the 94 concessionaires were listed by the Corps in the RRMS as being marinas and the others variously listed as resorts, bait stores, etc. The statistical analysis was done on the subset of marinas since it was primarily the marinas for which most data were available. Since so few concessionaires had resorts or lodges, no analysis could be run on those with lodges. Therefore, it was impossible to estimate a model for lodges.

Another important subset of data included those firms which reported interest and wage expense since these proved to be important management variables in early analyses and most firms reported on these two important items. Other subsets of data were used in earlier analyses, but the final sets are those adopted for estimation of the model in Chapter 6.

Regression Methodology

The regression program used is a standard classical least squares estimation program. The interpretation of results follows standard practice and usual assumptions about residuals and estimated residual statistics are presented where relevant. Means, standard deviations, variances and other measures used in the study are standard output of the statistical packages used at West Virginia University.

Discriminant Methodology

The discriminant analysis program used is a standard statistical program used at West Virginia University. As noted in Chapter 6, footnote 10, this program would not provide estimates of quadratic discriminant functions. The interpretation of results follows standard practice. The assumptions underlying this analysis are set forth in Chapter 6.

GUIDELINES FOR ATTRACTING PRIVATE CAPITAL

TO CORPS OF ENGINEERS PROJECTS

VOLUME II

RAYSTOWN CASE STUDY

Part A

A Study of the Feasibility
Of a Concessionaire-Operated Marina
At the Seven Points Site on Raystown Lake
Huntingdon, Pennsylvania

Part B

A Study of the Feasibility
Of a Concessionaire-Operated Resort/Lodge
At the Upper Corner Site on Raystown Lake
Huntingdon, Pennsylvania

by

James M. Rovelstad
Professor of Marketing

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VOLUME II

Part A

A Study of the Feasibility Of a Concessionaire-Operated Marina At the Seven Points Site on Raystown Lake Huntingdon, Pennsylvania

August 15, 1975

INTRODUCTION

This feasibility study is directed toward the basic objective of developing an optimum business profile for a marina at the Seven Points location on Raystown Lake. The mix of services and sales activities that together constitute this profile should, of course, be a function of both demand and supply functions so that the business can be operated at a profit. Therefore, the two principal areas of study are the forecasting of demand, and the estimation of a cost structure, including both investment and operating costs.

The first analytical section of this report is devoted to forecasting the demand for basic marina services at Raystown Lake, i.e., moorings, based on a demand model. Subsequent sections provide estimates of capital and cost structure and operating profits (or losses) for various blends of business activity, e.g., winter storage, boat rentals, and boat sales, when carried on in conjunction with mooring slip rentals. A statement of the objectives of this research and description of the nature, sources, and methods used in collecting the data for the analysis is provided in the section immediately following this introduction.

RESEARCH OBJECTIVES

The Corps of Engineers has plans for the development of the Raystown Lake impoundment as a major recreational complex in central Pennsylvania. Many of the facilities, e.g., campgrounds, swimming beach, and picnic areas are already nearing completion, under construction, or in the final stages of planning. However, those facilities which are to be developed and operated by private enterprise, i.e., concessionaires, have only reached the conceptual or pre-planning stages, except that specific areas and locations around the shoreline of the lake have been designated and set aside for these purposes.

A historical review of concessionaire-operated recreational facilities discloses that many fail to reach profitable levels of operation. This results in economic losses for the individual businesses, and

also in lost or reduced recreational benefits for the public when one of these businesses fails. Thus, the primary objective of this research effort is to provide the Corps with a projection of the feasibility of a profitable concessionaire-operated marina enterprise at Seven Points, and guidelines for the initial development of this facility. At the same time, these findings are expected to influence related concessionaire development decisions at other locations on the lake.

The key word in the statement of work for this research project was interpreted to be "feasibility." Thus, in the sections that follow, this is the central and primary emphasis. It follows that if feasibility is established, this will have been based on a set of assumptions with respect to the nature of the business operation, and these assumptions will be the basis for guidelines to initial development.

RESEARCH METHOD AND DATA SOURCES

Both time and cost constraints limited this study to a case analysis concept. That is, only a very limited amount of new empirical information could be obtained. Thus, the majority of the basic data used in forecasting the specific demand for the Seven Points marina and in estimating its probable cost structure is derived from secondary sources. Several regional marina facilities were studied as parallel cases to supplement and adjust these data where feasible. From these, a demand model was formulated, and a capital and operating cost structure synthesized for several combinations of business activity. These methods are described below.

On-site interviews were the principal sources of information. These have involved field trips to Raystown Lake, as well as similar sites in other areas of Pennsylvania, Maryland, New York, and West Virginia. In all, eight regional water-based outdoor recreation areas, in addition to Raystown Lake, were visited and examined to provide bases for regional demand estimates, investment costs, optimal product/service mix, operating expenses, and price structure. Data were also collected on three other lakes from secondary data and telephone interviews.

In-depth interviews were conducted with the marina management at each of the lakes. For some, this involved more than one business per lake. Where possible these interviews were accompanied by personal examination of financial records. In many cases management would not permit the latter, but they did provide a wealth of detail about operations including occupancy rates, rental charges, markups on sales items, and seasonal data, as well as valuable insights into the characteristics of the regional water recreation market.

Professional advice and information regarding current construction and equipment costs were obtained through telephone interviews and by mail from governmental and private organizations, and individuals. Personal contacts were also made with trade organizations, the state agencies responsible for small boat registration in Maryland, New York, Pennsylvania, Virginia and West Virginia, the U.S. Geological Survey, the U.S. Soil Conservation Service, and several academic professionals at West Virginia University. In all, it is estimated that between 250 and 300 person-hours were spent in this part of the data collection effort alone.

DATA ANALYSIS

Analysis of the data included two principal areas of effort--estimating demand and forecasting operational costs. Demand for marina services, broadly defined, included demand for mooring slip rentals, boat and motor rentals, repair services, sales of boats, supplies and accessories (including gasoline and oil), bait and tackle, off-season maintenance and storage, launching, and groceries and other food services. This case study proceeded from the hypothesis that slip rental demand, while perhaps not directly the most profitable phase of activity, is the basic demand element from which the vast majority of the traffic for all other business areas is derived. This question is examined in the following section. Succeeding sections postulate operating results for three sizes of mooring slip rental operations.

Demand for Pleasure Boating at Raystown Lake

Original planning estimates for the Seven Points Marina included mooring slips for 400 boats. However, no data were provided to indicate the basis for this estimate, or the additional mooring slips proposed for the several other planned marina facilities on the lake. Thus, a demand estimation model had to be formulated.

The principal data sources for demand estimation are the comparative case studies for other regional recreational lakes. These other lakes are all from the same general region of the U.S. as Raystown Lake. All are similar in regional topography (i.e., mountainous), demographics, and social and cultural values. There are variations in population size although most do not contain very large metropolitan areas, e.g., a standard metropolitan statistical area (SMSA) over 250,000. The case study lakes, along with some pertinent statistics, are shown in Table 1.

Several variables and combinations of variables were tested against the actual data for the several recreational lake case examples covered in this study. All of the models incorporate a primary market region definition. Initially, two market region sizes were examined. These were defined by a radius of either 30 or 50 miles about the lake under study. The smallest level of aggregation for the statistical data on population, demographics, water acreage, and watercraft registrations is for counties. Therefore, primary demand boundaries are adjusted to county lines, as shown in Figure 1. The variables considered for the models are listed briefly, below.[1]

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[1] Ideally, all of the independent variables from all of the models might well be combined in a single multiple regression model. However, the number of case examples is not large enough to permit this.

TABLE 1

SELECTED MARKET RELATED STATISTICS FOR RECREATIONAL LAKES
IN THE RAYSTOWN GEOGRAPHIC REGION

Lake	State	Area of Lake (acres)	No. of Slips Available	Primary Market Area Statistics--1973					
				Recreational Lake Area in Regions*		Population (000)		Boat Registration	
				30 mi.	50 mi.	30 mi.	50 mi.	30 mi.	50 mi.
Youghiogheny	Pennsylvania	2,750	300	7,500	8,850	1,107	1,359	13,376	16,095
Bluestone	West Virginia	2,040	72	2,040	4,763	438	602	7,008	9,251
Allegheny	Pennsylvania	12,080	472	21,630	21,630	363	942	10,493	23,476
Wallenpaupack	Pennsylvania	5,700	18	8,900	14,340	657	1,711	11,562	31,364
Deep Creek	Maryland	1,920	262	6,900	8,600	498	672	5,304	6,286
Summersville	West Virginia	2,723	220	4,243	6,283	393	557	5,026	7,044
Tygart	West Virginia	1,700	N.A.	3,430	5,350	339	610	2,466	5,072
Sutton	West Virginia	1,520	80	4,243	4,243	161	591	1,426	5,983
Cheat	West Virginia	1,730	325	6,400	8,100	704	2,978	6,917	29,970
Glendale	Pennsylvania	1,640*	484	1,640*	18,040*	680	1,262	8,545	15,724
Raystown	Pennsylvania	8,300*	---	8,300*	9,940*	385	1,044	4,887	13,307

*1975 figures.

**Measured in acres.

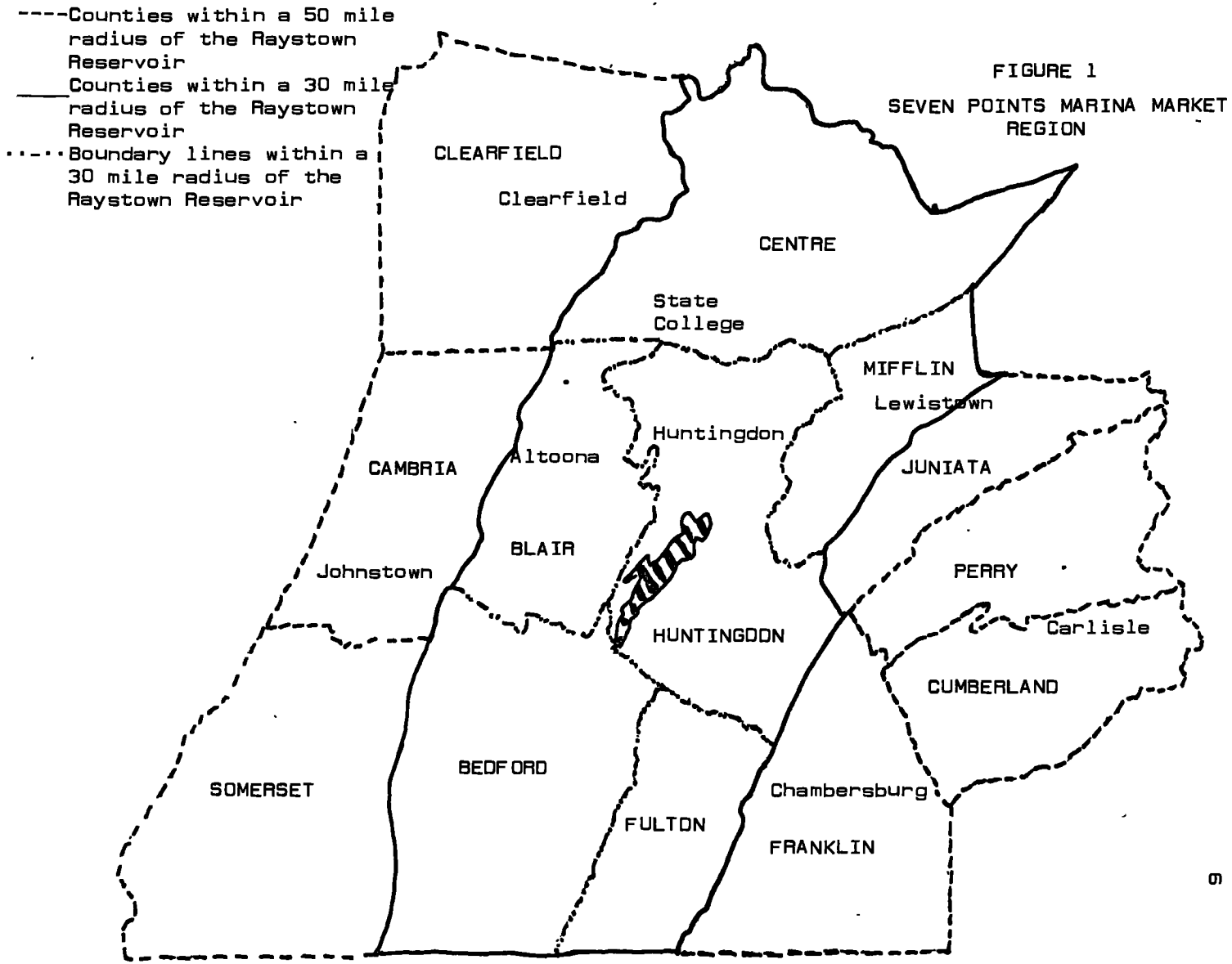

FIGURE 1

SEVEN POINTS MARINA MARKET REGION

Mooring Slip Demand Variables

Actual Number of Boat Registrations
Population (number)
Education
Occupations
Buying Power
Water Acreage
Actual Number of Slips Rented

Additionally, U.S. average data for the propensity to buy and/or use boats, as a function of occupation and age distribution were utilized to develop indices of boat ownership potential. Since a very large proportion of private boating in the U.S. is related to oceans, the averages for boat ownership and usage between the U.S. and the inland lake regions do not compare directly. However, the relative propensities as a function of these variables are believed to be comparable. Two such demographically adjusted indices were developed, one based on boating usage and the other on boat purchases. These are shown in Table 2.

TABLE 2

INDICES OF RELATIVE PROPENSITY TO BUY BOATS AND TO GO BOATING, BASED ON MARKET AREA OCCUPATIONAL CLASSES AND EDUCATIONAL LEVELS FOR SELECTED LAKE REGIONS, 1973 (30-MILE RADIUS)

Area	Propensity to Buy Boats	Propensity to Go Boating
U.S., Overall	100.00	100.00
Youghiogheny	98.29	96.30
Bluestone	99.53	105.02
Allegheny	96.73	103.95
Wallenpaupack	97.69	101.64
Deep Creek	97.30	95.98
Summersville	102.43	95.30
Tygart	93.83	96.70
Sutton	97.95	86.61
Cheat	98.49	97.29
Raystown	96.55	101.64
Average for All Regions	97.62	98.00

Source: See Appendix A-1.

Estimates of potential boat registrations were made for each test case area, using various combinations of the above variables. These were compared to actual boat registrations. None predicted closely for all cases. However, the fit was close enough for some of the models so that, when considered together, they provide a useful range of estimates for the Raystown region.

The second step in determining the demand for slips at Raystown required an estimate of the relationship between area boat registrations and actual slip rentals. A rather consistent relationship was found to exist between slip rentals in the test case areas and boat registrations in their respective primary market areas. Thus, the median ratio of boat registrations to slip rentals in the test case areas, along with the number of boat registrations projected for the Raystown market region, forms the basis for the estimation of mooring slip demand at Raystown lake. The findings from this and the preceding analysis are presented in Tables 3 and 4.

TABLE 3

RATIO OF BOAT REGISTRATIONS TO BOAT SLIPS
FOR SELECTED LAKES
(30- AND 50-MILE RADII)

Lake	Registrations/Slip Rental	
	(30 mi.)	(50 mi.)
Youghiogheny	44.6:1	53.7:1
Bluestone	97.3:1	128.5:1
Allegheny	22.2:1	49.7:1
Wallenpaupack	642.3:1	N.A.
Deep Creek	20.2:1	24.0:1
Summersville	22.8:1	32.0:1
Tygart	N.A.	N.A.
Sutton	17.8:1	74.8:1
Cheat	21.3:1	92.2:1
Glendale	17.6:1	32.5:1
Median	22.2:1	51.7:1

N.A. - Not available or insufficient data.

TABLE 4

ESTIMATED BOAT REGISTRATIONS FOR SELECTED REGIONAL LAKES,
AND ACTUAL REGISTRATIONS
(30-MILE RADIUS)

Lake	Estimates by Means of: Boats/Population (Propensity to Buy)	Boats/Population (Propensity to Boat)	Boats/Population/Water Acre (Propensity to Buy)	Boats/Population/Water Acre (Propensity to Boat)	Actual Boat Registration (From Table 1)
Youghiogheny	14,574	14,275	16,723	16,350	12,334
Bluestone	5,848	6,168	1,824	1,923	7,008
Allegheny	4,702	5,054	15,538	16,715	10,493
Wallenpaupack	8,596	8,944	11,689	12,157	11,562
Deep Creek	6,499	6,409	6,843	6,775	5,304
Summersville	5,396	5,023	3,502	3,252	5,026
Tygart	4,259	4,391	2,231	2,301	2,466
Sutton	2,117	1,872	1,372	1,217	1,426
Cheat	9,293	9,173	9,372	8,966	6,976
Raystown	4,983	5,245	6,329	6,648	4,887*

*Actual registration for Raystown area is based on 1973 data; before the lake was filled to recreational pool.

There is substantial consistency for the registration-to-slips ratio for the 30-mile market radius, with major exceptions of Bluestone and Wallenpaupack. The 50-mile data were not so consistent. The operator at Bluestone has indicated that an expansion is in the planning stage, and no data are available at this time to explain the Wallenpaupack paucity of slips. Therefore, the demand estimates used for Raystown are based on the median figure for the 30-mile market area.

Using the Raystown figures from Table 4, and the median ratio from Table 3, the projections for the number of slips needed at Seven Points range from 220 slips with no increase over 1973 registrations to a maximum of 299 slips in the projections reflecting the fact that the lake is now filled to recreational pool.

Two comments are relevant to the above estimates. First, it may be argued that the estimates reflect only regional (30 miles radius) demand. This is not true, however, since actual total slips for the case study lakes were used. In fact, some of these slips are rented to parties living a greater distance away. But local demand generally represents the greatest market share. The major assumption that underlies the use of regional boat registrations in the ratio is that the proportion of more distant rentals is relatively constant. The relative consistency of the 30-mile ratios suggests that this is true.

It may also be argued that the number of slips available does not reflect actual demand. Indeed, there appear to be two cases where this is true. But in general, it is reasonable to assume that the market mechanism has worked to stabilize supply at a level that can be supported by a reasonably stable minimum demand. Moreover, these statistics do not yet reflect the full impact of current market changes arising from fuel shortages and price rises. At present, the operators interviewed indicate that they are able to operate at nearly 100 per cent equivalent occupancy for the regular season. There are slips that are reserved for transients, but the higher rental rates for these tends to balance out to a full season rental equivalent.

In view of the above findings, it does not appear that Raystown Lake would initially support a marina with a capacity much greater than 250 slips. Although later demand growth might warrant expansion, it would be very risky to start at the 400-slip level. Moreover, the need for additional public marina facilities at other locations on the lake is not indicated.

Operational Forecast

The full scope of operations of a large marina facility may encompass a restaurant, grocery and sundries stores, boat/motor accessories, launching facilities, gasoline and oil sales, boat/motor repairs and services and winter storage, all in addition to mooring slip rentals. A complete analysis of all of the combinations of these operations is beyond the scope of this study. However, a limited investigation has been made of several of these possibilities and these are discussed below in terms of a phased development sequence.

The initial phase covers three closely-related activity areas which are common to nearly every marina operation, namely, mooring slip rentals, boat and motor rentals, and gasoline and oil sales. The second phase adds repairs and services, launching, winter storage, and accessory sales. Finally, a marina including both of the above, plus sales of new and used boats and motors is postulated.

All phases are analyzed for three sizes of basic marina activity: 250 slips, 350 slips, and 450 slips. Analysis of basic demand for slip rentals at Seven Points has already indicated that a 250-slip operation is the largest that a prudent entrepreneur would want to invest in, initially. However, the forecasts for larger-scale operations help to bring out the effects of economies of scale on financial results. Moreover, one of the basic assumptions in this study is that demand for all of the related business areas such as boat sales and winter storage, is linked to the basic marina service, i.e., mooring slip rentals. Thus, if ultimate demand for mooring facilities should be greater than estimated, potential concessionaires will be able to evaluate the impact of this.

The three phases of operational development--basic marina; marina plus storage and service; and marina plus storage and service, plus boat sales, are treated as sequential development decisions, or building blocks. Thus, the costs and revenues for each expansion in scope of operations are shown as marginal figures, i.e., as additions or subtractions to the related costs or results from the preceding level.

Many assumptions had to be made in arriving at the operating forecasts. Wherever possible, these are based on empirical data. Where sufficient data were not available, the estimates are based on judgment and experience. However, the bases or sources for the assumptions are stated in the text or accompanying tables. Several of the general assumptions that will apply to all levels of operations are listed below:

1. Seven Points will have a five-month operating season (May 1 to October 1), although service and sales activities, plus storage, will produce some off-season revenue.

2. Current assets (cash plus inventories) are estimated at 5 per cent of total investment.

3. Financing of current assets and non-fixed assets will be through equity capital, and of fixed assets by debt at a market rate of 10.5 per cent.

4. Except where noted, all capital investments for new construction or equipment are estimated at current full market material and/or labor costs. Many existing marinas, and other new businesses, are started largely, or in part, with do-it-yourself efforts by the ownership, for which no labor charge is incurred, and by use of non-union labor. For example, boat docks are frequently built by hand, using part time and/or temporary labor, e.g., college students, and used materials. Thus, fixed asset investment cost might be held substantially lower than is indicated in the estimates. However, there is no

realistic or consistent basis for estimating the amount of savings available; and, to attempt to do so probably would be misleading to the Corps and to potential concessionaires.

5. Straight-line depreciation is determined on the basis of both a 10- and a 20-year lease. However, the only assets which are affected by the 20-year depreciation period are buildings, parking lots, and utilities. Where appropriate, salvage values are provided for non-fixed assets. Other depreciation periods are as listed below:

Boat slips	10 years
Gas dock	10 years
Furniture, fixtures and tools	8 years
Vehicles	3 years (1/3 salvage value)
Rental boats and motors (except rowboats)	3 years (1/3 salvage value)
Rental rowboats	5 years

6. The office and accessory building is estimated based on traditional on-site construction at $30.00 per square foot. All other buildings are based on prefabricated steel construction systems (such as "Armco" or "Butler"), and priced according to projected design needs.

7. Parking lot costs are shown for actual price received from Huntingdon-area contractors for a paved lot. The gravel-only lot is estimated at one-half of the paved lot. Costs are based on:

30 square yards/car

Number car spaces = 1 1/4 x number mooring slips

Number trailer spaces = 1/4 x number mooring slips

8. Several operating costs, e.g., advertising, utilities, insurance, and maintenance, are derived as percentages of gross revenues or gross fixed assets, based on the observed averages from selected marina financial statements.

9. Wage rates for employees, other than the manager, are as follows:

General labor (seasonal)	$2.10/hr
Secretary/bookkeeper	$2.50/hr
Mechanics (Phase II)	$5.50/hr
Mechanics helpers (Phase II)	$3.50/hr
Sales clerk (Phase II only, part time)	$2.50/hr
Salesperson (Phare III only)	$75.00/week+ commission

10. Special, one-time start up costs such as legal fees, are not included, but would be necessary to take into consideration by a concessionaire in his initial planning.

Phase I - Basic Marina

The basic marina operation consists of the rental of mooring slips, boat and motor rental, and sales of gasoline and oil. As was noted in the beginning of this analysis, these activities may be thought of as traffic builders for the other complementary business areas. Nevertheless, it is important to know just how well such operations might perform if conducted alone. The results for 250-, 350-, and 450-slip sizes of operation are shown in Table 5. The estimated investment costs to reach each level of operation are shown in Table 6.

Losses are projected for all three sizes of basic marina operation. Many of the cost factors are estimates, based on a wide variety of variables and

TABLE 5

FORECAST OF ANNUAL INCOME FOR A BASIC MARINA
FOR SELECTED SIZES OF OPERATION

Item	Operating Revenues and Costs by Number of Slips 250	350	450	Remarks/ Basis
Sales (net of state sales taxes):				
Gas and Oil	$ 34,086	$ 47,720	$ 61,355	190 gallons of gasoline per slip Margin = $.17
Cost of Sales (including state and federal taxes)	25,557	35,780	46,003	per gallon.
Gross Income from Sales	$ 8,529	$ 11,940	$ 15,352	
Rental Revenues:				Assume 100% Equivalent
Moorings Slips (at $10.00 per ft. per season)	$ 48,900	$ 68,460	$ 88,020	Slip occupancy rate; 48%
Boat Rentals	14,310	25,835	46,125	18', 40% 20', 14% 24', and
Gross Rental Revenues	$ 63,210	$ 94,295	$134,145	6% 35' or longer.
Gross Income	$ 71,739	$106,235	$149,397	
Operating Expenses:				
Salaries and Wages	$ 19,466	$ 22,299	$ 24,316	Includes legal and account-
Insurance	7,282	9,823	12,334	ing services. Insurance =
Utilities	2,870	4,249	5,976	2.34% of fixed assets.
Maintenance	4,668	6,297	7,907	Utilities = 4% of gross
Advertising	1,792	2,656	3,735	income. Maintenance =
Operating Supplies and Other Expenses	4,973	7,318	10,136	1.56% of fixed assets. Advertising = 2.5% of gross income.

TABLE 5 (Continued)

Item	Operating Revenues and Costs by Number of Slips 250	350	450	Remarks/ Basis
Taxes, Licenses, and Permits (including payroll, and state corporation taxes)	$ 1,267	$ 1,467	$ 1,623	
Corps License Fee	1,492	2,220	3,142	
Depreciation:				
10 years/20 years	$ 34,967/$ 28,804	$ 47,835/$ 39,811	$ 63,475/$ 53,862	
Total Operating Expense:				
10 years/20 years	$ 78,778/$ 72,615	$104,164/$ 96,140	$132,644/$123,031	
Interest Expense	32,677	44,077	55,348	
Total Expenses:				
10 years/20 years	$111,455/$105,292	$148,241/$140,217	$187,992/$178,379	
Net Income (Loss):				
10 years/20 years	($39,716) ($33,553)	($42,006) ($33,982)	($38,595) ($28,982)	

TABLE 6

PROJECTED INVESTMENT REQUIREMENTS FOR A BASIC MARINA
FOR SELECTED SIZES OF OPERATION

Item	Size (Number of Slips) 250	350	450	Remarks
Current Assets (cash and inventories)	$ 16,677	$ 22,706	$ 29,138	C.A. = 5% of fixed + non-fixed assets.
Non-fixed Assets:				
Rental boats and motors	9,720	18,615	34,960	
Vehicles and trailers	5,000	7,600	9,800	Assume vehicles bought used.
Furniture and fixtures	4,500	5,000	6,200	
Total Non-fixed Assets	$ 19,220	$ 31,215	$ 50,960	
Fixed Assets:				
Boat docks	$ 175,000	$ 245,000	$ 315,000	Estimated at $700 per
Gas dock	12,940	14,300	19,850	slip, average.
Building	6,600	6,900	7,500	See text.
Parking lot (paved, unlighted)	91,665	128,520	159,770	Estimated at $9.00 per
Utilities (sewer, water, electric)	25,000	25,000	25,000	squre yard.
Total Fixed Assets	$ 311,205	$ 419,780	$ 527,120	
Total Investment	$ 347,102	$ 473,701	$ 607,218	

assumptions which could vary substantially in actual implementation. However, the two largest cost items are depreciation and interest, which, in a sense, will make or break the business. Actual costs for the balance of the cost items should not vary significantly enough to change the overall results.

The term of the Corps' lease to a concessionaire would probably not be longer than 20 years, and losses still result under this condition as shown in Table 5. Even if a longer-term lease, say, 30 years, were feasible, it is unlikely that the depreciation period would be extended beyond 20 years. The only exception might be for utilities. The major difficulty here is the large proportion of total investment in non-revenue producing assets, particularly in the parking area.

The Corps has indicated that it may be willing to negotiate a contract based on an unpaved parking area. If a graded and graveled parking area is provided, assuming the cost to be one-half of a fully paved lot, this would significantly reduce estimated losses at all three sizes of operation, as shown in Table 7. However, operations are still projected to be unprofitable for all three sizes.

A greater proportion of equity financing would, of course, reduce loss, or even result in a small profit if the larger-size operations appeared feasible, although they do not at this time. In any case, for this business venture to appear attractive to most investors, income projections, after taxes, would have to be at least as large as the estimated interest rate of 10.5 per cent. This would mean a before-tax rate of return of around 20 to 25 per cent.

It is concluded that a basic marina operation will not be profitable at Seven Points under the conditions and assumptions described here. The only change which could conceivably reverse this conclusion would be those which would dramatically reduce fixed investment. The only obvious possibility would be for the Corps to provide the parking, and perhaps install utilities.

Phase II - Marina plus Storage and Service

Having mooring facilities tends to create a natural market for off-season storage of the craft docked during the boating season. These same customers, especially those utilizing the storage services, are also potential customers for repair and maintenance services.

TABLE 7

NET OPERATING RESULTS
WITH A GRAVEL PARKING LOT
FOR 10- AND 20-YEAR DEPRECIATION PERIODS*

Depreciation Period	Net Income (Loss) by Number of Slips 250	350	450
10-Year	($28,720)	($26,552)	($19,358)
20-Year	($24,845)	($21,711)	($13,739)

*Assume cost of gravel parking lot equals one-half of that of bituminous paved lot.

Therefore, the most natural extension of the basic marina operation is to provide these services, along with sales of minor accessories and bait and tackle.

To a degree, common capital is employed in these extended services. Examples include the office facilities, maintenance equipment and vehicles, and even the parking lot, if above winter water levels, for off-season storage area. However, most marinas providing storage also provide protected storage, especially in regions having fairly harsh winter climates. Moreover, mechanics need a heated area if they are to perform maintenance and repairs, and will need special tools and equipment. The overall likelihood, however, is that such off-season use of facilities should lead to improved capital and resource efficiency.

This study did not include detailed specifications of buildings and facilities. But in order to develop a projection of cost structure, some conceptual specifications were necessary for buildings, boat storage systems and shop facilities. These are described briefly below, along with several additional assumptions regarding service operations.

1. Maintenance and shop facilities will be constructed using a commercial pre-fabricated steel building system. With utilities, the costs for this building were estimated at $10.00 per square foot. (Derived from informal quotes by builders in the Morgantown, West Virginia and Warren, Pennsylvania areas.)

2. Covered storage will be in an open-sided extension to the shop building, with no utilities, using similar construction. The open sides will be canvas-covered during the winter, but provide easy access for boat removal. The cost of this addition to the structure (in #1 above) is estimated at $6.00 per square foot.

3. Smaller craft (up to 24' feet) storage will be in three-tiered racks constructed of hand-assembled pipe and fittings. Larger craft will be stored on individual cradles. A forklift truck will be rented during the spring and fall season to store or remove small craft from the racks.

4. Accessories and bait and tackle sales will be accommodated in a small extension to the office building planned for the basic marina operation. Costs are estimated at $20.00 per square foot for this facility addition, which might also accommodate minor grocery or packaged snack sales. In addition, a minnow cooler and ice machine are included.

The additions to the basic marina capital structure are shown in Table 8 for the three sizes of operations. Income effects from storage and service operations are shown in Table 9. Additional assumptions regarding

Table 9 are that the 250-slip operation will employ two full-time mechanics, whose time is sold directly 65 per cent and 80 per cent, respectively, with the balance being either non-productive or non-direct charge activities, such as winter/spring, paid at a flat rate. Larger size operations would employ more mechanical help.

The service, storage, and accessory sales operations do make a positive contribution to net income. However, with a paved parking lot for the basic marina, the income from these activities is not large enough to offset the large capital cost in the basic marina. If the parking lot is not paved, and if a 20-year depreciation period is used, a small profit is forecasted for the 450-slip operation level, and a relatively small loss indicated at the 350-slip level. It is recalled that demand estimates indicate that initial capacity should not exceed 250 slips, which would dictate against the chance of achieving the near break-even point otherwise suggested for larger operations.

Realistically, given the dependence of these forecasts on the assumptions made, the reliability of the data available, and the inherent potential for error in the estimates, it appears that the larger size Phase II operation, with a gravel parking lot, would probably be able to breakeven. With above average management, and stability or growth in the Raystown water-based recreation market, it is quite possible that the venture would be successful, i.e., survive the first three- to five-year critical period. On the other hand, the forecasts would not, on the average, make the business attractive to investors, so financing would most likely be a problem.

Phase III - Marina, Plus Storage, Service and Boat Sales

Boat sales are another natural market extension of the basic marina operation. This factor relates well also to service and off-season storage. A sales activity, per se, is potentially the most capital efficient and lucrative, if a high enough turnover rate can be developed, because very little additional

TABLE 8

PROJECTED MARGINAL INVESTMENT REQUIREMENTS FOR
THE ADDITION OF SERVICE, STORAGE AND ACCESSORY SALES
TO BASIC MARINA ACTIVITIES

Item	Size (Number of Slips) 250	350	450	Remarks
Additional Current Assets:				
Inventories	$ 24,909	$ 31,338	$ 37,757	
Total Additional Current Assets	$ 24,909	$ 31,338	$ 37,757	
Additional Non-fixed Assets:				
Tools and equipment	$ 2,600	$ 2,900	$ 3,500	Personal tools supplied
Furniture and fixtures	1,200	1,600	2,000	by mechanics.
Other	1,700	2,200	3,200	
Total Additional Non-fixed Assets	$ 5,500	$ 6,700	$ 8,700	
Additional Fixed Investment:				
Accessories building addition	$ 5,760	$ 8,320	$ 12,000	
Storage/maintenance shop	75,400	96,000	102,750	
Storage racks (protected storage only)	3,270	4,524	5,774	15% of boats moored.
Total Additional Fixed Assets	$ 84,430	$ 108,844	$ 120,524	
Total Additional Investment, Phase II	$ 114,836	$ 146,882	$ 166,891	
Total Investment, Phase I and II	$ 461,938	$ 620,583	$ 774,709	

TABLE 9

FORECAST OF MARGINAL INCOME FROM ADDITION OF STORAGE, SERVICE AND ACCESSORIES SALES TO BASIC MARINA OPERATIONS

Item	Size (Number of Slips) 250	350	450	Remarks
Additional Sales (net of state sales taxes):				
Parts, accessories, bait and tackle	$31,922	$42,426	$52,902	Margin = 30%
Less cash of goods sold	23,863	31,674	39,457	of cost on
Gross income from additional sales	$ 8,059	$10,752	$13,445	parts and bait and tackle, 40%
Labor sales	$31,900	$38,892	$45,892	on accessories.
Additions to Gross Sales Income	$39,959	$49,648	$59,337	Labor sold at $11.00 per hour.
Additional Rental Revenues:				
Indoor storage	$13,466	$18,834	$24,188	Rate = $9.00
Outdoor storage	3,168	4,392	5,670	per foot.
Storage-related services	2,226	3,215	4,121	
Additions to Gross Rental Revenues	$18,860	$26,441	$33,979	
Additions to Gross Income, Phase II	$58,819	$76,089	$93,316	
Operating Expenses Arising from Additions to Gross Income:				
Salaries and wages	$23,082	$29,385	$34,950	
Insurance	1,976	2,547	2,820	

TABLE 9 (Continued)

Item	Size (Number of Slips) 250	350	450	Remarks
Utilities	$ 2,353	$ 3,044	$ 3,733	
Maintenance	1,317	1,698	1,880	
Advertising	1,470	1,902	2,333	
Taxes	1,381	1,757	2,092	
Other, including forklift rentals	1,788	2,360	2,534	
Corps license fee	724	968	1,210	
Depreciation: 10/years				
20 years	$ 9,283/$ 5,225	$11,884/$ 6,668	$13,322/$ 7,297	
Total Additions to Operating Expense, Phase II	$43,362/$39,304	$55,545/$50,329	$64,874/$58,849	
Interest Expense	8,865	11,429	12,655	
Total Additions to Expense, Phase II	$52,227/$48,169	$66,974/$61,758	$77,529/$71,504	
Net Additions (Subtraction) to Income Before Taxes, Phase II: with 10 years depreciation	$ 6,592	$ 9,115	$15,787	
with 20 years depreciation	$10,650	$14,331	$21,812	

TABLE 9 (Continued)

Item	Size (Number of Slips) 250	350	450	Remarks
Total Net Income (Loss) Before Taxes, Phase I and II:				Combined with Table 5.
with 10 years depreciation	($33,124)	($32,891)	($22,808)	
with 20 years depreciation	($22,903)	($19,651)	($ 7,170)	
Total Net Income (Loss) Before Taxes with Gravel Parking Lot, Phase I and II:				Combined with Table 7.
with 10 years depreciation	($22,128)	($17,407)	($ 3,571)	
with 20 years depreciation	($14,195)	($ 7,380)	$ 8,073	

investment is needed to support a fast sales rate than a slow sales rate. On the other hand, sales of expensive items, such as boats, are subject to wide fluctuations which increase cost and risk.

The Seven Points marina has both significant advantages and disadvantages as a potential boat sales site. Being a marina facility in itself provides an advantage, because those using these facilities and services also are one of the market segments most likely to be interested in new boats. Moreover, the basic business, plus the availability of service and off-season storage should give Seven Points' management valuable insight and experience into the marketing of boats.

At the same time, the Seven Points' location may also be a disadvantage. Its limited accessability for the region at large could keep away many potential buyers who will not be mooring at Seven Points, i.e., those buying their first boat who do not live nearby, and those who will only use Raystown Lake for part of the season. The local population density is moderate, and there are already several competitors for this market.

One of the principal market opportunities for Raystown area boat dealers is the new demand created by the opening of the lake in 1974-75. One area dealer, interviewed in this study, reported that his business is well above expectations for 1975 season. Undoubtedly, this reflects the projected demand increase. For a possible Seven Points dealer, however, this means that much, if not most, of the new demand in the Raystown market area will have been satisfied by the time he opens for business, say in 1977.

Projections of boat sales for Seven Points take all of the above factors into consideration. Several of the key assumptions upon which these forecasts are based are stated below:

1. By the time Seven Points is open, regional (30-mile) demand will have stabilized with total registrations at 6,489. (An average of the projections made earlier in this section).

2. The replacement and new purchase rate for registered watercraft for the region will be 1:12 of registered regional watercrafts per year, based on data from International Marine Expositions, Inc., 1974 Market Research Notebook.

3. Seven Points mooring slip rental customers will replace or trade-up at a faster rate of 1:5.1 per year. (Same source as #2, above.)

4. Of the estimated total of 540 registered boats (excludes canoes and some rowboats) to be bought in the region, those purchased by non-Seven Points slip renters will be evenly divided among the 15 dealers in the Raystown area.

5. Seven Points will capture 50 per cent of the market from their own mooring slip customers.

6. The mix of sizes and classes of motors and boats purchased will parallel the national averages for freshwater boats. (Same source as #2, above.)

7. A 10 per cent down-payment will be required to finance boats in inventory, and the balance of this floor plan will be carried by a loan at 1.2 per cent per month, with an average time in inventory of four months.

The projected additional capital needs to enter the boat sales business at Seven Points are shown in Table 10, and the forecasts of income in Table 11. Total investment will be $560,808 for the 250-slip marina, and $867,516 for the 450-slip marina. A loss is projected for the 250-slip operation, regardless of depreciation period or parking lot paving, although the best results for this size -- a loss of about $7,000 per year -- could be considered close to breakeven.

A small to moderate profit would be feasible for a 450-slip operation, if demand warranted its development. The gravel parking lot, 20-year depreciatio

TABLE 10

PROJECTED MARGINAL INVESTMENT REQUIREMENTS
FOR THE ADDITION OF BOAT SALES
TO THE MARINA/STORAGE/SERVICE OPERATION
AT SEVEN POINTS

Item	Size (Number of Slips) 250	350	450
Additional Current Assets:			
Cash	$ 2,948	$ 3,384	$ 3,646
Inventory	29,482	33,835	36,461
Total Additions to Current Assets	$ 32,430	$ 37,219	$ 40,107
Additions to Non-fixed Assets (format fix)	$ 600	$ 800	$ 1,100
Additional Fixed Investment:			
Buildings	$ 65,841	$ 75,280	$ 81,600
Total Additional Investment, Phase III	$ 98,871	$113,299	$122,807
Total Investment, Phase I, II, & III	$560,808	$733,882	$867,516

configuration would yield a 16.7 per cent before-tax return on equity capital. Of course, the key to how feasible this is relates back to the forecast of basic mooring slip demand, and the validity of the hypothesized relationships between this and the other business activities.

CONCLUSIONS AND RECOMMENDATIONS

The above analysis has developed into what may be viewed as somewhat of a paradox. That is, a marina at Seven Points can be reasonably assured of stable demand for about 250 mooring slips on a full-season basis with concomitant demand in other business areas. On the other hand, to be economically successful the marina

TABLE 11

FORECAST OF MARGINAL INCOME
FROM ADDITION OF BOAT SALES
TO MARINA/SERVICE/STORAGE OPERATIONS
AT SEVEN POINTS

Item	Operating Revenues and Costs by Number of Slips 250	350	450
Additional Sales (net of state sales taxes)			
New boats	$148,761	$182,031	$212,231
Used boats	5,000	6,600	8,000
New motors	43,241	50,204	58,020
Trailers	5,926	6,424	7,224
Total Additional Sales	$202,928	$245,259	$285,475
Cost of Goods Sold	155,553	186,612	217,999
Additions to Gross Income, Phase III	$ 47,375	$ 58,647	$ 67,476
Operating Expenses Rising from Additions to Gross Income:			
Salaries and commissions	$ 9,917	$ 10,602	$ 12,140
Insurance	1,541	1,762	1,909
Utilities	1,895	2,346	2,699
Maintenance	1,027	1,174	1,273
Advertising	1,184	1,466	1,687
Freight	3,254	4,072	4,643
Floor planning (finance charges)	6,719	8,064	9,420
Taxes	613	657	750
Other	3,215	3,992	4,667
Corps license fee	350	430	497

TABLE 11 (Continued)

Item	Operating Revenues and Costs by Number of Slips 250	350	450
Depreciation: 10 years/ 20 years	$ 6,659/$ 3,367	$ 7,628/$ 3,864	$ 8,298/$ 4,218
Total Additions to Operating Expenses, Phase III	$36,374/$33,082	$42,193/$38,429	$47,983/$43,903
Interest Expense	6,913	7,904	8,568
Total Additions to Expense, Phase III	$43,287/$39,995	$50,097/$46,333	$56,551/$52,471
Net Additions (Subtractions) to Income Before Taxes, Phase III:			
with 10 years depreciation	$ 4,088	$ 8,550	$10,925
with 20 years depreciation	$ 7,380	$12,314	$15,005
Total Net Income (Loss) Before Taxes, Phase I, II and III:			
with 10 years depreciation	($29,036)	($24,341)	($11,883)
with 20 years depreciation	($15,523)	($ 7,337)	($ 7,835)
Total Net Income (Loss) Before Taxes with Gravel Parking Lot, Phase I, II and III			
with 10 years depreciation	($18,040)	($ 8,857)	$ 7,354
with 20 years depreciation	($ 6,815)	$ 4,934	$23,078

probably has to be able to operate at about the 400- to 450-slip level. Superficially, at least, it would appear that the average investor would decline the opportunity to invest in the business.

There may be some mitigating factors, however, which could lead to a greater probability of success. In general, these tend to be those which will substantially reduce the size of the investment -- particularly fixed investment. Some of the possibilities are summarized below.

1. The concessionaire may be able to make significant savings in out-of-pocket costs if he can perform much of the dock construction himself, and make use of used or low-cost materials. Of course, this could well lead to lowered aesthetic appeal, and might in the long run cost as much because of shorter life and/or dissatisfied customers.

2. The availability of low interest loans, possible through the Appalachian Regional Commission, the Small Business Administration, the Pennsylvania Department of Commerce, local revenue bonds, or some combination of these would make a significant difference, because of the high interest burden and/or rates of return currently demanded for private capital.

3. Further concessions by the Corps, beyond the allowance for a gravel parking lot, could reduce the size of fixed investment and/or the amount of non-revenue producing investment. For example, these might include complete provision of initial parking facilities, access roads, and utilities by the Corps.

There is no doubt that even though the <u>average</u> business operator assumed herein is likely to be unsuccessful, there is a possibility that an innovative, aggressive and creative management could reach profitable levels of operation. Or, an existing regional business, e.g., boat dealer, may be able to take some advantage of the economies of

combined operations to produce a profit. Therefore, pre-screening of bidders might help to provide assurance of a sound venture to meet public needs.

It seems particularly appropriate to note that while Raystown Lake is in a beautiful natural setting, it suffers one major disadvantage in attracting investors in the immediate future. This is basically a problem of newness, and lack of a public image for the area. In a study conducted by the Pennsylvania Department of Commerce, in 1969, travel industry investors were found to prefer sites in established resort areas, which have already achieved public awareness and acceptance. Moreover, they want convenient major highway access. And finally, the study found that investors were generally wary of investments on public lands and of the uncertainties of local government's responsiveness to needs for new or improved infra-structure, e.g., highways.

In conclusion, the Seven Points marina site is a marginally attractive investment opportunity for the short run. The longer range potential is too dependent on such unknown factors as the effects of the fuel shortages, inflation, and especially specific marina management and marketing skills to allow for valid projections. However, from the public points of view, Raystown Lake is a valuable resource which should be protected as much as possible from the potential damage that a marginal or unprofitable venture might inflict. It is recommended that the following be considered by the Corps as it develops final plans for the concession.

1. Devise development specifications to minimize the requirements for fixed capital investment.

2. Consider providing some of the non-revenue producing fixed assets as part of the agreement.

3. Coordinate with federal, state, and local government agencies to make qualified bidders aware of the possibilities for low-interest investment loans.

4. Pre-screen bidders to assure that only those with proven marketing and management ability in the travel and tourism industry will be considered.

5. Delay indefinitely any plans for other marina developments at Raystown Lake, at least until the Seven Points marina and regional demand are improved.

Finally, in view of the risks apparent to both the potential investor and to the public's existing investment at Raystown Lake, it may be that an alternate approach to the marina development at Seven Points would be attractive. Since the Corps already has a sizeable investment in recreational facilities at Seven Points, it might wish to undertake the marina development, too. This could be run as a model to evaluate future marina concession plans, and to establish guidelines for successful concession agreements and operations. The fact that the Corps already employs a park manager at the location should enhance the feasibility of such an approach.

APPENDIX A-1

$$\sum_{i=1}^{5} P_a = \sum_{i=1}^{5} \left(\frac{A_i}{X_i} \times B_i \right)$$

where

P_a = each area's propensity to go boating.

A_i = per cent of the area's population over 25 years of age in the ith educational category.

X_i = per cent of the U.S. population over 25 years of age in the ith educational category.

B_i = per cent of the U.S. boaters in 1973 over 25 years of age in the ith educational category.

$\sum_{i=1}^{5}$ = summation over all five educational categories.

$$P_b = \sum_{j=1}^{8} \left(\frac{A_j}{X_j} \times B_j \right)$$

where

P_b = propensity to buy boats

A_j = per cent of the area's population at least 16 years old, employed in jth occupational category.

X_j = per cent of the U.S. population at least 16 years old employed in the jth occupational category.

B_j = per cent of the U.S. population in jth occupational category that purchased boats in 1973.

$\sum_{j=1}^{8}$ = summation over all eight occupational categories.

Source of population data: 1970 Census of Population, U.S. Department of Commerce, Bureau of Census, vol. 22, 32, 34, 40, 48, and 50.

Educational categories used:

a) under 8 years of schooling
b) 1-3 years of high school
c) 4 years of high school
d) 4 or more years of college

Occupational categories used:

a) skilled
b) semi-skilled
c) professional
d) clerical, sales
e) managers, proprietors
f) farmers and labors
g) service workers
h) factory workers

Source of data on the U.S. population in each boating category in 1973: International Marine Expositions, Inc., The Marine Market (Chicago: International Marine Expositions, Inc., 1974).

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VOLUME II

Part B

A Study of the Feasibility Of a Concessionaire-Operated Resort/Lodge At the Upper Corner Site on Raystown Lake Huntingdon, Pennsylvania

February 25, 1976

INTRODUCTION

This report describes the results of the second phase of a two-phase feasibility study of planned concessionaire-operated recreational developments at Raystown Lake, Pennsylvania, a U.S. Army Corps of Engineers Project. The phase one report provided an analysis of the potential for a marina development at the Seven Points site. This report covers the feasibility evaluation of a separate, but related, development potential for a resort/lodge facility on the Upper Corner site, adjacent to Seven Points.

As in the previous study for the Seven Points marina, the two principal areas of this analysis are the forecast of demand and estimation of a cost structure, including both investment and operating costs. These analyses examine selected levels of operation over a range of facility sizes and modes of operation. This study, and the earlier Seven Points study, are interrelated to the extent that the majority of the services which are assumed to be available at Seven Points, principally long-term docking, fuel, and service facilities for larger, powered watercraft are not included in the Upper Corner Resort facility concept studied here.

A demand forecast, based on an empirically derived model, is presented in the first analytical section of the report. This forecast is based on data obtained by mailed questionnaires completed for similar regional resort complexes. This is followed by sections presenting estimated operational results for four sizes of resort operation, operated for varying season lengths ranging from six to twelve months. Special consideration is given to the three-month summer "high" season, which for many resorts is the keystone of their operating performance.

RESEARCH OBJECTIVES

Many of the general public use facilities at Raystown Lake are being constructed by the Corps of Engineers, and are either already in place, under construction, or in the final planning stages.

However, several of the planned recreational services, generally those requiring the more intensive capital investment and/or operating management effort, are designated for concessionaire development and operation, i.e., to be constructed and operated by private enterprise -- at a profit.

Experience with concessionaire developments on public land, whether federal or state, has been somewhat discouraging. Significant numbers fail to reach profitable levels, resulting in economic losses to the businesses involved as well as in lost or dimished recreational opportunities for the public. Indeed, the results of a comparison study conducted by West Virginia University for the Corps of Engineers, Volume I of this report, indicate that, nationally, over 40 per cent of their concessionaires for water-based recreation businesses, representing over 50 per cent of concessionaire capital investment, are losing money.

The primary purpose of the research reported here, as was true of the Seven Points marina study cited earlier, is to provide the Corps with a site-specific analysis, and set of development criteria, so that guidelines for concessionaire leasing specifications can be defined. The results should improve the probability of enterpreneurial success, and thereby optimize the public's long-run benefit.

"Feasibility," for the purposes of this research, is defined as having been established when a concessionaire can construct and operate the lodge facility at a profit level which will, at a minimum, provide a return on capital consistent with the risk involved and comparable with other similar types of investments in the private sector. Obviously, this will be dependent in large part on a number of assumptions about the state of capital markets, the costs of materials and services, and the general state of the U.S. and regional economy. Where it was practicable, these were drawn from standard reference sources. In some cases, data were obtained from reliable personal sources of the researchers. In a few cases where no reliable external resources were available, assumptions drawn from the researcher's experience were made. However, in all cases the sources and bases of the data used are cited so that trade off evaluations can be made.

RESEARCH METHODS AND DATA SOURCES

As with the earlier Seven Points study, time and cost constraints dictated a case-analysis approach. Primary sources of data for demand estimation included a brief mail questionnaire, entitled the Resort Hotel Survey, which was sent to a selected group of 38 resort facilities, and a letter of inquiry to 19 of the major national travel lodgings franchisers and chains.[1] Additional data on the size and character of the travel lodgings industry in the regions in which each of the responding resorts is located were obtained from published trade and industry sources.

Operating cost data were obtained primarily from secondary sources, although a limited number of personal and telephone interviews were conducted. Construction and outfitting costs were obtained from personal contacts, with particularly valuable assistance being provided by the Parks Division of the West Virginia Department of Natural Resources. Standard engineering cost reference sources were used when data available from direct primary sources were insufficient or incomplete. Wherever possible, these standard reference sources were also used to verify, or provide the bases for adjustments to, information from secondary and/or personal sources.

The data are interpreted in the context of a demand model developed in the research. Specifically, this model is a resort lodgings demand model. Demand for other typical resort provided services, e.g., food and beverages or recreational facilities, is derived from a distributive model of resort operations which is based on national averages for resorts. The pricing of rooms and services, which with demand determine revenue, is assumed to be at competitive levels. That is, it is assumed that room rental rates will not be set at a level lower than market demand would otherwise permit, as is sometimes done in publicly-owned concessionaire-operated recreation facilities.

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[1] Copies of the resort questionnaire and inquiry letter are included in the appendixes to this report.

ANALYSIS

Demand Forecast

Demand, as it relates to a recreational facility such as the Upper Corner Lodge, is made up of several components. These include the demand for overnight accommodations, food and beverage services, use of recreational facilities such as tennis courts and pleasure boats, and the use of meeting facilities for organized groups. Many of these services are available to and used by day visitors, as well as overnight guests.

Ideally, a forecast should be developed for each of these functional areas of the resort business, which when added together would provide an estimate of aggregate demand for the resort owners. However, experience in developing economic impact measurement and forecasting models for state-level trade and tourism markets indicates that the data base for model development in most of these areas is extremely difficult, if not impossible, to acquire.[2]

Aside from data acquisition problems, it is reasonable to assume that for a resort/lodge complex situated, as the Upper Corner facility will be, away from large population centers and major (or even secondary) highways, the majority of revenues in other business areas will be generated by overnight guests. Thus, the basic demand factor, upon which the subsequent operating analysis is based, is the demand for overnight lodgings.

Lodgings Demand Forecasting

Three proxy variables were considered for use in estimating lodging demand at Upper Corner. One possibility considered was to employ available national

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[2] James M. Rovelstad, Analytical Measures of Travel and Tourism for States and Smaller Areas: The West Virginia Model (Morgantown, West Virginia: Bureau of Business Research, West Virginia University, 1974), Ch. 2; idem, Behavior-Based Marketing Strategies for Travel and Tourism: The West Virginia Model (Morgantown, West Virginia: Bureau of Business Research, West Virginia University, 1975), Ch. 1.

average occupancy rates. Table 1 shows these figures, for 1974, as a function of resort location and size.

It is evident from Table 1 that occupancy rates, as might be expected, vary widely -- so that a reliable estimate for a specific site such as Raystown Lake is difficult to obtain. Moreover, perhaps the greatest danger in using occupancy rates

TABLE 1

AVERAGE OCCUPANCY RATES
FOR 100 SELECTED U.S. RESORT HOTELS
1974

Type/Location	Occupancy (%)
All	72.0
Northeastern	49.6
Southeastern	67.5
Central	66.0
Hawaii	71.2
250 Rooms and Fewer	64.9
Over 250 Rooms	73.5

Source: Trends in the Hotel/Motel Business - 1975 [New York: Harris, Kerr, Forster and Company, 1975], p. 31.

is that the available data are not disaggregated sufficiently. For example, Raystown Lake is in the Northeastern region, which encompasses all of the states in an area stretching from Illinois to New York, and from Maine to West Virginia. Since this region includes such a wide variety of recreational opportunities, population characteristics, and economic conditions, it should be expected that results will vary substantially within this region.

Indeed, in our limited survey of selected inland resorts located in the states of Pennsylvania, Ohio and West Virginia, the average annual occupancy was 59.72 per cent. This figure varies substantially from the 49.6 per cent reported for the Northeastern region, thus dictating against the use of such averages for the Upper Corner Lodge forecast.

A second proxy variable was suggested by a recent study which reported the use of a lodging demand model obtained from John Child and Company.[3] The mathematical expression of this model is provided as follows:[4]

$$R = \frac{TPL}{365N},$$

where

R = Room demand per night, at 100 per cent occupancy

T = Number of visitors that travel over 50 miles to visit the site [A detailed explanation of the over-50-mile constraint was not provided.]

P = Proportion of visitors who will stay in overnight lodgings

L = Average length of stay, per party

N = Average number of persons per room

Even if the above model could be adapted for the Raystown case, a forecast of total visitations would be required also because the lake has not been open for public use long enough for these figures to have stabilized. Thus, this approach also was felt to be inapplicable.

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[3] "A Study of the Market Potential for Small Craft Marina Concessions at Lake Shelbyville," U.S. Army Corps of Engineers, St. Louis District, 1975, Appendix II, p. 28.

[4] Ibid.

The thrid proxy variable was to use our survey of regional resorts [the Resort Hotel Survey], along with available social and economic statistics for their respective areas. This appeared to provide the highest probability [of the three considered] of indicating the demand for lodgings at the Upper Corner Lodge. In fact, one of the corroborative measures used in the Lake Shelybville resort study was an income-stratified population statistic.[5] Thus, the demand estimation model which is employed here is based on empirical, site-specific data.

Concept of Market Region

The geographic definition of a resort's market is less obvious than might be expected. Some resorts appear to have a highly concentrated regional market area, while others draw their clientele from a wide national or international market. An example of the latter might be the Greenbrier, in White Sulphur Springs, West Virginia. Undoubtedly, the geographic size of the market for any given resort is a function of such factors as the scope and quality of the experience provided, the maturity and history of the resort, and the uniqueness of the area's attractions, plus many others. The difficulty with these indicators in demand forecasting is that there appear to be no specific techniques for quantifying these variables.

As was suggested earlier in this analysis, there is a paucity of reported methodology for resort demand estimation. This is confirmed by the Corp's St. Louis District in its report, and may be partially explained by a historical lack of interest in the science of analysis in this field of marketing, as would be indicated by experience in general with regard to research for the travel industry.[6] It may also be that the proprietory aspects of such models as do exist in the realms of private business concerns, e.g., the Holiday Inns and Sheraton Hotels, act to

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[5] Ibid.

[6] Ibid., Appendix IV, p. 15.

limit their dissemination. In any case, they are not readily available to the researcher in the public domain. As corroboration of these conclusions, none of the 19 national organizations, including those mentioned above, to which inquiries were sent in this study responded with useful information concerning demand forecasting.

The Lake Shelbyville study uses distance as the basic market definition. It defines the primary market as the population within a 100-mile radius, the secondary market within a radius of 101-200 miles, and the tertiary market within a radius of 200-300 miles.[7] Responses to the Resort Hotel Survey indicated an average of 38.75 per cent of their guests came from within a two-hour driving distance (about 100 miles), as shown in Table 2. However, this figure varies from 0 to 75 per cent, basically indicating that distance is a poor general determinant.

The demand data from the Resort Hotel Survey were examined in the context of a variety of regional income and population variables, with little consistency in reported operating results, i.e., room demand. Consequently, an alternate approach to market definition was necessary. Instead of defining a market in terms of demand variables, it also is possible to describe it in terms of supply-related variables, e.g., the characteristics of competition. Of course this concept would be useful only in an area where competition exists. As for the Raystown region, there is, in fact, a supply of commercial lodging facilities, although probably none would be considered "resorts."

Lodging Unit Demand Forecasting Model

It was hypothesized early in this analysis that, for an existing market area, the overall level of lodgings demand would be reflected by the size and

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[7] Ibid., p. 28.

TABLE 2

ESTIMATED DRIVING TIME FOR GUESTS VISITING EIGHT RESORTS IN OHIO, PENNSYLVANIA, AND WEST VIRGINIA

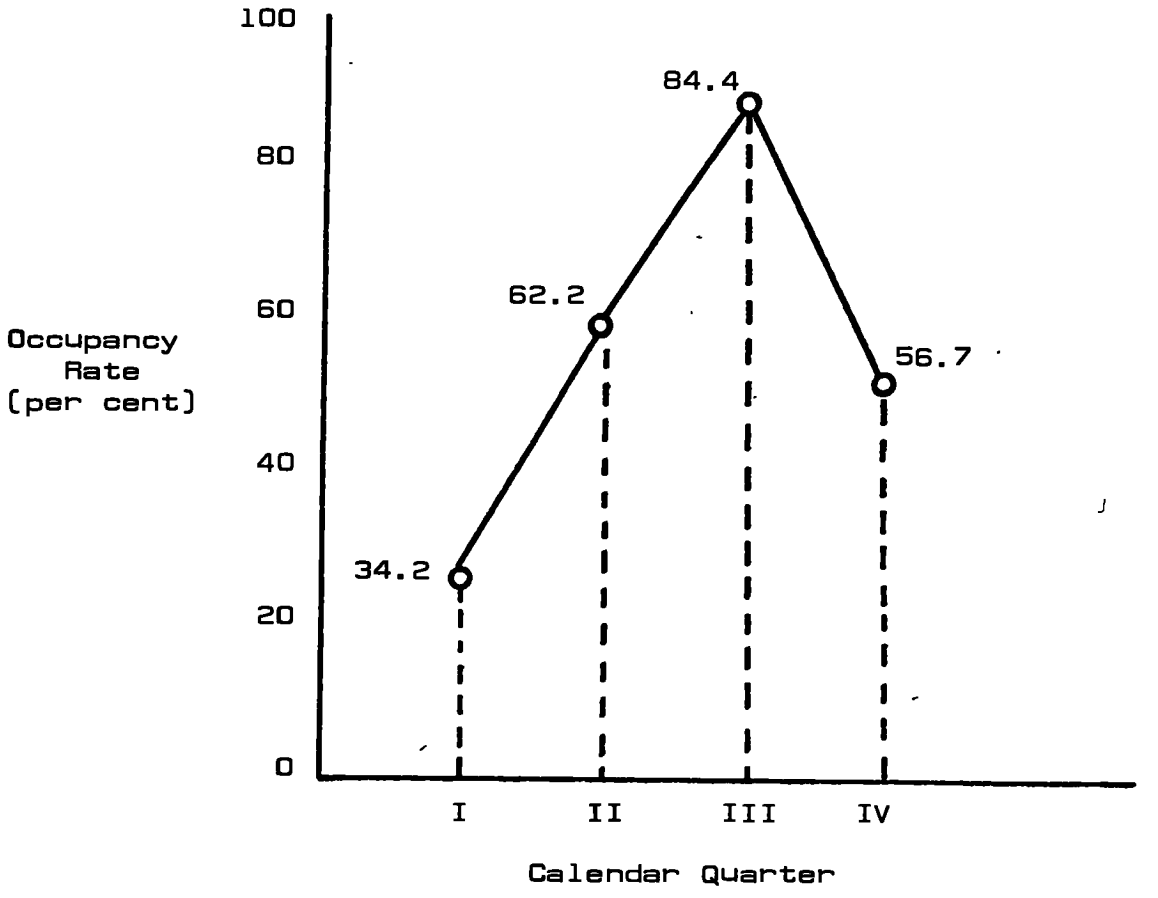
Driving time	Per Cent of Guests		
	Low	High	Average
time < 1 hour	0	25	11.250
1 hour ≤ time < 2 hours	0	50	27.500
2 hours ≤ time < 3 hours	15	60	33.125
time > 3 hours	10	80	28.125
			100.000

scope of existing facilities in that area. That is, the relative success of a lodgings facility, for example a resort, would be in part a function of the extent to which the facility "fits" with other competitive lodgings in its area. This hypothesis, if accepted, would suggest that for each area there is, at any given time, an optimum facility size. If a larger facility is developed, barring the existence of some entirely unique and desirable market appeal, its occupancy rate would be lower than normal, even though the total number of rooms rented might be greater than at the optimum size. Conversely, if it is too small, its average occupancy rates would be higher, but the resort would have insufficient capacity to meet demand during its peak season(s), and thus suffer lost sales.

The eight regional year-round resort hotels responding to the survey reported an average occupancy of 34.2 per cent for January through March, and an average of 84.4 per cent for July through September. However, as seasonality is an especially significant factor for resorts, it is of considerable importance to the overall results that this "high season" peak not be too severely truncated by insufficient capacity. Figure 1 shows the actual seasonality reported by the responding resorts.

FIGURE 1

SEASONALITY OF RESORT OCCUPANCY RATES FOR EIGHT RESORTS IN PENNSYLVANIA, OHIO AND WEST VIRGINIA



The relationship that was ultimately developed compares the average number of rooms rented per night by a resort to the resort's size index; the latter being defined as the ratio of the number of guest rooms offered by that resort to the average number of rooms offered by all commercial lodgings facilities in the resort's market region. The relationship is an expontential function, and takes the following form:

$$Y_t = KX^e,$$

where

Y_t = Average number of rooms rented per night during a specified time period, t (e.g., 12 months, first quarter, etc.)

K = A constant term

X = Size index = $\dfrac{\text{Number of rooms available at resort}}{\text{Average number of rooms per commercial lodging facility in resort's market region}}$

e = An exponent, specific for time period "t," and $0 < e < 1$

The "market region" used in this study consists of those counties within a 30-mile radius of the resort facility, as shown in Figure 2. Since this region is defined in terms of supply, rather than demand, the actual distance traveled by guests coming to the resort is irrelevant. Instead, it is only important that the region is sized appropriately to reflect the nature of the market within which the resort competes for business. While the choice of 30 miles may be subject to further refinement, it appears that it is a reasonable level of regional dissaggregation for the Eastern United States and that each region would appear to be a relatively homogenous travel destination to the potential customer. This same market region definition was supported by the empirical data, and employed, in the Seven Points Marina study.[8]

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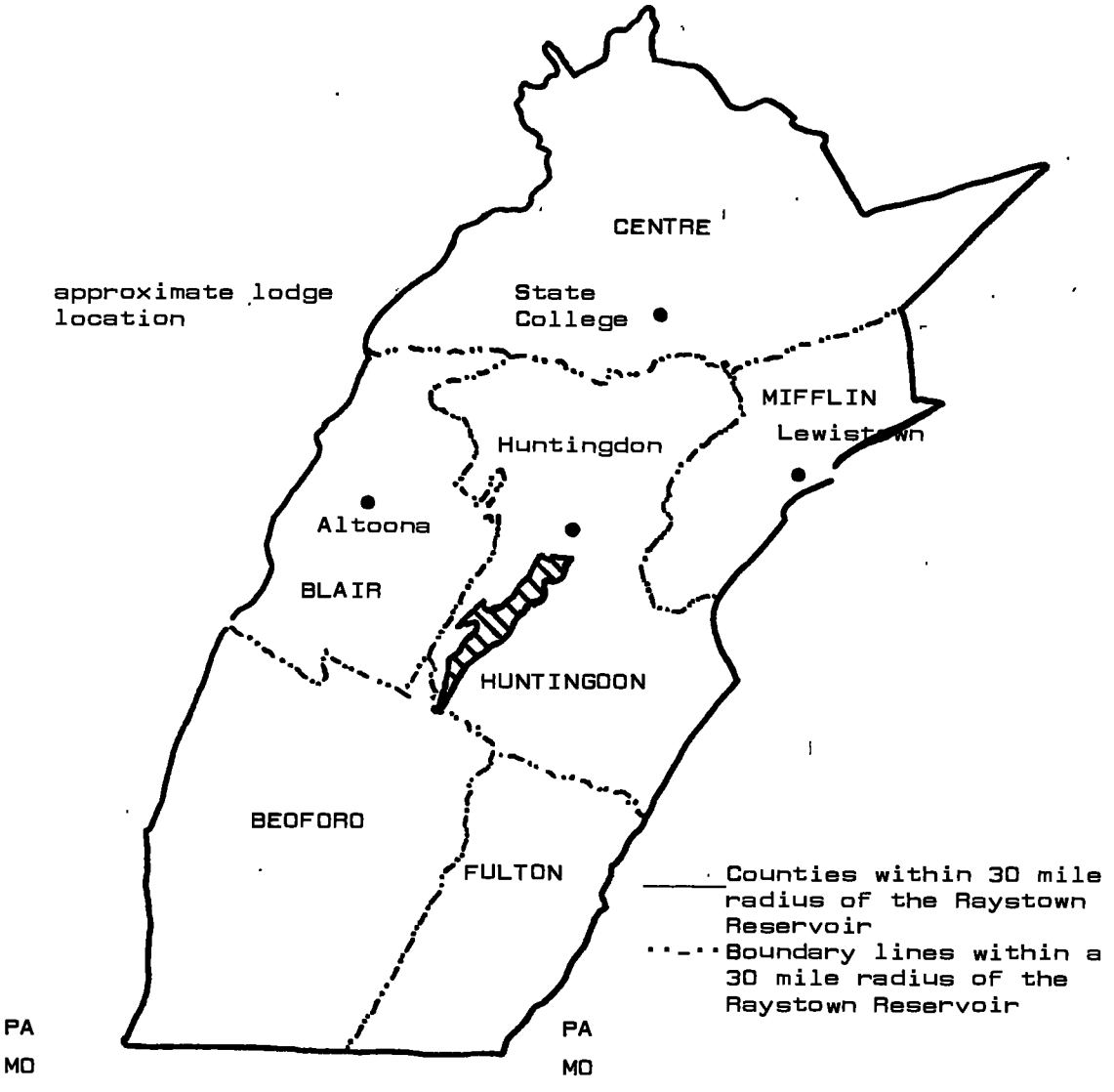
[8]James M. Rovelstad, "Feasibility Study of a Concessionaire-Operated Marina at the Seven Points Site on Raystown Lake, Huntingdon, Pennsylvania [a research report prepared for the U.S. Survey, Corps of Engineers, Baltimore District, under Contract No. DACW31-75-C-0077, draft submitted August 15, 1975], p. 39.

FIGURE 2

COMPETITIVE MARKET REGION FOR
UPPER CORNER LODGE/RESORT



Four logarithmic equations describe the relationships discussed above. There is a specific equation for the year (12 months) average, extended season (9 months, April-December), primary season (6 months, April-September), and high season (3 months, July-September). Only the first three are used in computing full operating results. However, the fourth, high season, is needed to determine the existence of truncated demand during this period. (It is possible with a model of this form to predict room rentals in excess of 100 per cent, which would indicate that actually the resort will be unable to achieve the predicted 12 month average rate.) The four equations were developed through regression analysis and are as follows, with R^2 values, t values for the coefficients, and related probabilities shown for each.

Yearly Model: $\log Y_{12} = 1.59691 + 0.779448 (\log X)$
($R^2 = .55$)
($t = 2.493$, one-tail prob. = 0.0275)

Extended Season Model: $\log Y_9 = 1.65331 + 0.767829 (\log X)$
($R^2 = .57$)
($t = 2.551$, one-tail prob. = 0.0251)

Primary Season Model: $\log Y_6 = 1.67561 + 0.821854 (\log X)$
($R^2 = .61$)
($t = 2.774$, one-tail prob. = 0.0196)

High Season Model: $\log Y_3 = 1.75561 + 0.760983 (\log X)$
($R^2 = .60$)
($t = 2.739$, one-tail prob. = 0.0204)

TABLE 3

RESORT PERFORMANCE AND REGIONAL MARKET CHARACTERISTICS
FOR SEVEN RESORTS IN THE EASTERN U.S.

Resort	Location[a]	Number of Units	Occupancy Rates -- 1974 Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Year	Average Units[c] Establishment (in Market Area)	Size Index
A	Ohio	168	41.8	66.0	86.8	58.5	63.3	38.8	4.330
B	Ohio[b]	153	50.0	75.0	100.0	75.0	75.0	80.5	1.900
C	Pennsylvania	193	30.0	70.0	80.0	60.0	60.0	64.0	3.016
D	Pennsylvania	100	40.0	80.0	90.0	40.0	65.0	42.5	2.354
E	Pennsylvania[b]	120	37.0	72.0	98.0	60.0	67.0	55.9	2.145
F	West Virginia[b]	50	30.0	55.0	90.0	65.0	60.0	44.2	1.131
G	West Virginia	168	25.0	60.0	85.0	50.0	55.0	43.6	3.856
	[The two resorts listed below were excluded from the analysis because of insufficient data.]								
-	Pennsylvania	45							
-	West Virginia	650							

[a]Exact locations are omitted to conceal the identities of the respondents.

[b]Some occupancy figures were adjusted to provide internal consistency with the overall data reported.

[c]Source: Leahy's Hotel Motel Guide and Travel Atlas, 1974 (Chicago: American Hotel Register Company, 1974).

These equations were derived from responses to the Resort Hotel Survey, pertinent results of which are shown in Table 3, along with the average number of rooms per establishment in the market region, and size index for each. The theoretical yearly average number of rooms rented per day is a function of the index, as shown in Figure 3. The salient characteristic of this model is that the exponent for the independent variables, the size index, is less than unity. In general, as the size (number of lodging units) of a resort gets larger compared to its regional lodgings competitors, it will be able to rent more rooms, but its average occupancy rate (and therefore cost efficiency) will fall.

There will also be a minimum economic size, however, because of the highly seasonal demand characteristics for the typical resort. In order to achieve the market potential during high season, a trade off of lower occupancy rate for the balance of the year may be appropriate. The daily demand relationship for the July-September season is also shown in Figure 3. The optimum size for a specific resort will depend on its cost structure, the relative economies of scale, and demand.

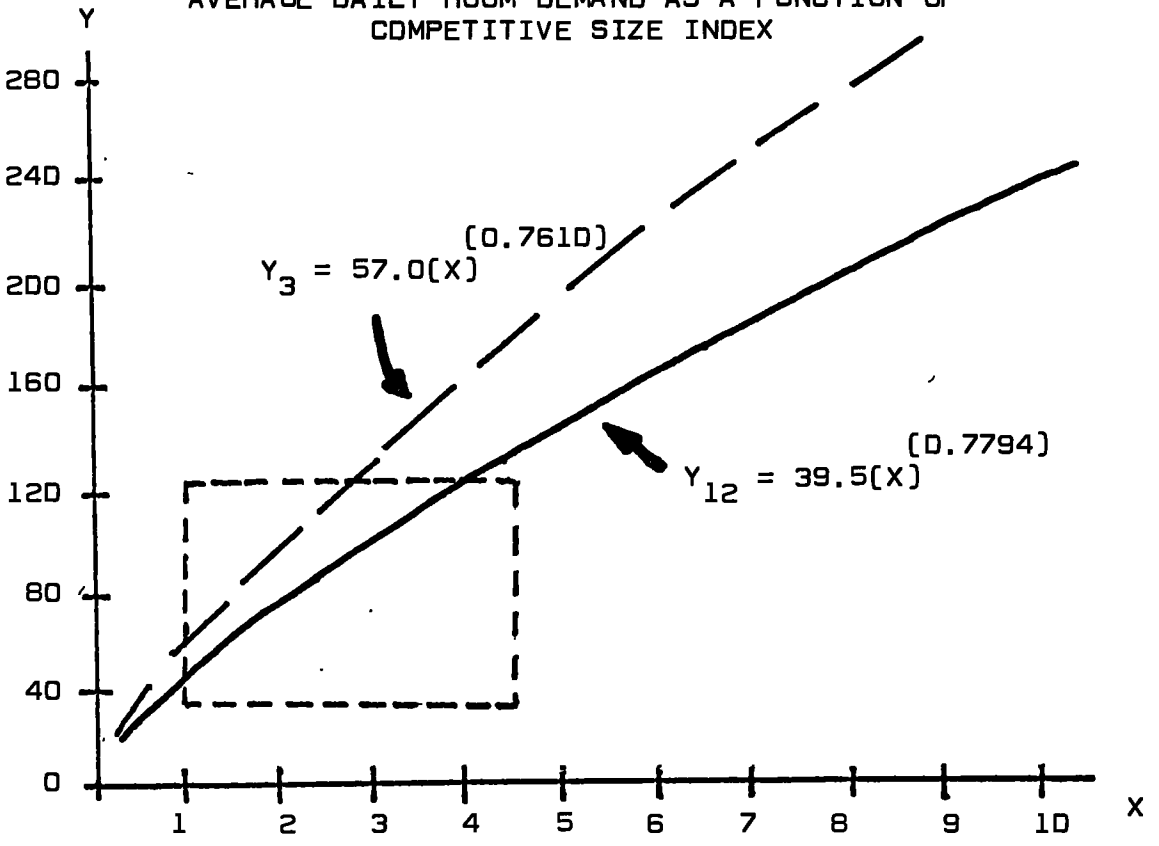
Upper Corner Demand Forecast

Total lodgings demand for the lodge at Upper Corner, using the models described in the preceding section, will be a function of the actual number of units provided, and the regional size index for the Raystown Lake area. Table 4 summarizes these data, and the results of applying the demand models to a range of sizes for the Upper Corner Lodge.

Both experience and the size of competitive commercial lodgings operations in the Raystown region suggest that 50 lodging units is probably beyond the lower limit for a facility that would be considered a resort today. Indeed, the resort hotels included in the Harris-Kerr-Forster sample averaged nearly 400 rooms, while their sample of motels and motor hotels

FIGURE 3

AVERAGE DAILY ROOM DEMAND AS A FUNCTION OF COMPETITIVE SIZE INDEX



Average Rooms Demanded Per Day

$$X = \text{Index} = \frac{\text{Number of Lodge Units at Resort}}{\text{Average Number Units per Establishment in Market Region}}$$

-----Sample Data Range

Y_{12}= Annual Average

Y_3 = High Season Average

TABLE 4

AVERAGE DAILY ROOM DEMAND
FOR A LODGE AT UPPER CORNER

Number of Units in Lodge	Regional Size Index[b]	Average Number of Rooms Rented/Day				Yearly Occupancy Rate
		Jul-Sep	Apr-Sep	Apr-Dec	Jan-Dec	
50	1.043	50[59][a]	45[49][a]	43[47][a]	39[41][a]	.78[.82][a]
100	2.059	98	86	78	69	.69
150	3.051	133	118	106	94	.63
200	4.019	164	149	131	115	.58

[a]Numbers in parentheses indicate the lodging demand predicted by the seasonal demand models. These figures cannot be achieved during the July-September season, however, because of an excess of demand over supply.

[b]Regional Size Index = $\frac{\text{Number rooms in Upper Corner Lodge}}{\text{Average number of rooms per commercial lodging facility in 30-mile market region}}$

with restaurants averaged 181 rooms.[9] However, the 50-unit size is included as a basis for evaluating the trade off between scale economies and the seasonality of demand, in the context of the Raystown competitive environment.

The results of the above projections cannot be interpreted without relating each level of operations to the capital investment and operating costs associated with each level of operation. This is done in the next section of the report, along with projections of operating results for the related business areas, i.e., restaurant, lounge, and miscellaneous items.

It is noted that the lodgings demand forecasts are derived from a very limited statistical data base, and that the demand models derived therefrom must be considered tentative pending further verification. In fact, it is likely that other site-specific variables, such as access by major highways, probably will be a part of an ultimate demand model. Further, it would also be desirable to include factors from the demand side of the market, e.g., income and other socio-economic characteristics of the "market." However, the models do conform with the hypotheses proposed in this study, and are logically defensible. Given the fact that the non-quantifiable management variable probably contributes more to the ultimate success of a resort facility than most others, these models appear to provide a sound basis for a preliminary feasibility study.

Analysis of Operations

Operating results for a complex facility, such as a resort lodge, are a function of general demand, facility size, the range of services sold, the amount of capital invested, the season[s] of operation, and, especially, the quality of management. Moreover, most of these are interrelated, such that a change in one variable can bring about substantial changes in the others. A complete analysis of all of the permutations

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[9] Trends in the Hotel/Motel Business - 1975 (New York: Harris-Kerr-Forster and Company, 1975), pp. 29, 35.

and combinations of these variables is beyond the scope of this study. Two of the most significant variables, size and season of operation, are treated independently in the analyses that follow. All of the others are derived from averages, or standards, for the industry.

Assumptions

A number of assumptions were made in developing the operational forecasts. The general approaches followed were described earlier in the research methods section. The more significant of these assumptions are as follows:

1. Food and beverage, and other miscellaneous sales are based on national averages for resort hotels and are a fixed percentage of lodgings revenues.[10]

2. The direct costs for departmental operations, and costs, other than amortization of non-current assets, are derived from national averages for resort hotel operations, with minor adjustments and additions to reflect special or local conditions, such as Corps license fees.[11]

3. No fixed assumptions are made as to the sources of capital. However, interest costs of 10.5 per cent on long term debt to finance all or part of the fixed capital investment are estimated to reflect current market conditions. The effect that these charges would have on net income is shown at the end of the income statements.

4. Fees paid by the concessionaire to the Corps of Engineers are calculated at the rate applicable for rentals (as contrasted with sales), and reflect the maximum concessionaire

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[10] Trends in the Hotel-Motel Business, 1975 (New York: Harris-Kerr-Forster and Company, 1975).

[11] Ibid.

obligation. If all or part of these fees were based on the lower [sales] rate, there would be a substantial, positive impact on operating results.

5. Straight-line depreciation is applied to all assets for periods, as follows:[12]

Item	Depreciable Life [yrs.]*
Furniture, fixtures and equipment	8
Boats	5
Water, sewerage and utilities	20
Buildings	20
Roads and parking areas	20
Recreation facilities	10

*Assume a 20-year lease. If longer, some figures for depreciable life could be greater.

6. Building and facilities construction costs are based on standard, commercial code, on-site methods, using the following guidelines:[13]

Lodge

Bedrooms: 450 ft^2/bedroom @ \$30.00/ft^2
Public Area: 150 ft^2/bedroom @ \$40.00/ft^2

Water Supply: Line from Raystown Lake Park Headquarters - 1,800 ft @ \$6.00/lin ft.

Sewage Treatment: Package plant, secondary treatment -- capacity: 120 gal/day/bedroom, plus 35 gal/day/dining room cost/day.

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[12]James J. Eyster, "The Hotel-Motel Feasibility Study," The Cornell Hotel and Restaurant Quarterly [November 1973], p. 10.

[13]Cornell Hotel and Restaurant Quarterly, May 1975; West Virginia Department of Natural Resources, Parks Division; Robert S. Godfred, ed. Building Construction Cost Data, 1975 [Duxbury, Massachusetts: Robert Snow Means Co., Inc, 1975]; and personal sources.

Swimming Pool: Assume use is 2 persons per bedroom and:
25.9 ft^2 of water surface per person for 100 units,
20.95 ft^2 of water surface per person for 150 units,
16.0 ft^2 of water surface per person for 200 units.[14]

Other recreational facilities include:

Playground Equipment
Tennis courts
Landing & fishing pier, plus mooring slips and rental boats at the rate of one for each 5 rooms, plus floating buoys for temporary mooring of guest boats.

7. Access road and parking to include 1,350 ft. of new road, 18 ft. wide from end of existing road to lodge, resurfacing of 1,800 ft. of existing road, 16 ft. wide, from county road, paved lodge parking area at 30 $yd.^2$ per guest room, and 2,550 ft., 16 ft. wide, gravel road to boat dock area.[15]

8. One-time start up costs, such as legal fees, are not included in the analysis, but would be a necessary consideration for a potential concessionaire.

Capital Investment

The Upper Corner Lodge configuration upon which this analysis is based includes the following features:

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[14] Godfrey, Construction Cost Data, 1975, Ibid., p. 277.

[15] Ibid., p. 34; West Virginia Department of Natural Resources, Parks Division; and personal sources.

Lodging facilities for 100, 200, 300, or 400 persons, depending on the size variable, and assuming double occupancy.

Complete, full service restaurant and kitchen.

Lounge bar.

Meeting rooms.

Recreational facilities, including tennis, swimming, boating and fishing.

Location on site, as shown in Figure 4.

The above design differs in several significant characteristics from the conceptual design indicated in earlier studies of the Corps of Engineers.[16] In the main, these differences reflect the smaller scale of operations suggested by the demand analysis presented earlier in this report, and by the Seven Points Marina Study.[17] However, the scale could be increased in the future to the original concepts, should demand and the economics of operation warrant it.

Capital investment requirements for the four levels of operation considered are summarized in Table 5. These costs range from $1.98 million to approximately $6.10 million. Several non-revenue producing, and wholly or partially size-independent, items make up a substantial part of these costs, e.g., roads, parking, swimming pool and utilities. These sum to $759,810 or 12.4 per cent of the total for the 200-room facility; $550,236 or 16.9 per cent of the cost for the 100-room configuration; and $540,830 or over 27 per cent of the 50-room resort, respectively. Thus, there are clearly significant economies in capital investment to increasing scale of operations.

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[16] Raystown Branch, Juniata River Pennsylvania Public Use Plan Design Memorandum No. 14. Prepared for the Department of the Army, January 1969.

[17] James M. Rovelstad, "Feasibility Study of a Concessionaire-Operated Marina at the Seven Points Site On Raystown Lake, Huntingdon, Pennsylvania" [a research report prepared for the U.S. Survey, Corps of Engineers, Baltimore District, under Contract No. DACW31-75-C-0077, draft submitted August 15, 1975], p. 39.

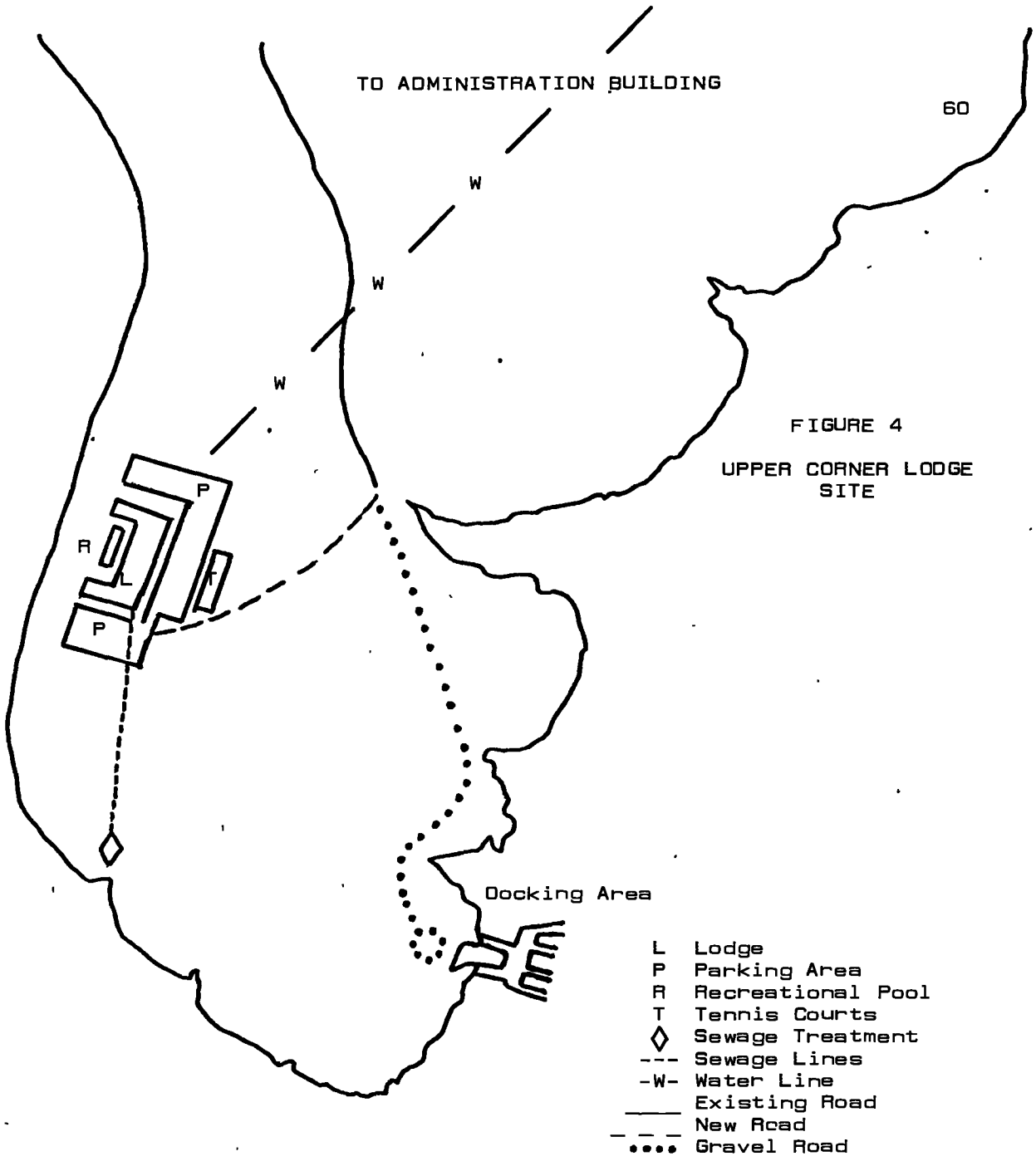

FIGURE 4

UPPER CORNER LODGE SITE

Operating Results -- 12-Month Season

Whether the potential economies of scale can be realized depends primarily on demand. As was shown in the demand analysis section, average occupancy rates tend to decrease, ceterus paribus, as a resort capacity exceeds the level of "normal" demand for an area. Using the empirical models described earlier, the expected revenues for selected facility sizes were estimated, and projected operating costs determined, based on typical Eastern resort experience. These figures are shown in Table 6.

Both the 100-room and 150-room facilities are projected to be marginally profitable, and the 50- and 200-room resorts both indicate losses. Of the four configurations analyzed, the 100-room size is the most profitable in both absolute terms and in return on investment. However, the estimated return, 1.7 per cent, would not be attractive to investors, since it is far less than they could get from any of the "safe" alternatives, including passbook savings accounts.

Given that there are many uncertainties and assumptions in the data upon which the operating results were based, it is quite possible that actual results could be significantly higher, or lower, than are forecasted here. However, this possibility does not alter the conclusion that a resort of approximately 100-150 room capacity will be the optimum size, at least for the initial period of operation.

An important factor that would be a likely feature of the financing for any new resort complex is the use of debt capital. The size of the interest charges, assuming 100 per cent debt financing for long-term fixed assets, and their effect on income is also shown in Table 6. While the per cent of debt capital an investor might obtain would be subject to a variety of variables, the example is probably not unrealistic, e.g., this would provide 83.6 per cent financing for the 100-room facility. The result of the use of debt capital, however, is an estimated net loss for all four configurations examined.

TABLE 5

PROJECTED INVESTMENT REQUIREMENTS FOR A RESORT FACILITY
FOR SELECTED SIZES OF OPERATIONS

Item	Size (lodge rooms) 50	100	150	200
Current Assets (cash and inventories)	$ 57,688	$ 95,108	$ 137,632	$ 177,304
Non-Fixed Assets:				
Furnishings and fixtures	$ 192,500	$ 355,000	$ 535,000	$ 715,000
Utensils, tools and equipment	32,000	59,000	84,750	108,000
Rental boats and watercraft	16,050	23,775	31,725	40,050
Total Non-fixed Assets	$ 240,550	$ 437,775	$ 651,475	$ 863,050
Fixed Assets:				
Lodge	$1,065,000	$2,040,000	$3,060,000	$4,080,000
Kitchen equipment	50,000	65,000	80,000	90,000
Recreation facilities (swimming pool, playground, tennis courts, and docks)	250,644	282,450	390,973	459,598
Roads and parking lot	126,230	126,230	146,480	166,730
Utilities (water lines, waste water treatment and electric lines)	190,500	208,000	248,000	267,000
Total Fixed Assets	$1,682,374	$2,721,680	$3,925,453	$5,063,328
Total Investment	$1,980,612	$3,254,563	$4,714,560	$6,103,682

TABLE 6

FORECAST OF EXPECTED AVERAGE INCOME FOR SELECTED SCALES OF RESORT OPERATIONS AT UPPER CORNER, RAYSTOWN LAKE, FOR YEAR-ROUND OPERATION

Item	Size (lodge rooms) 50	100	150	200
Sales:				
Rooms*	$ 421,200	$ 745,200	$1,015,200	$1,242,000
Food	307,125	543,375	740,250	905,625
Beverage	105,300	186,300	253,800	310,500
Telephone and other	43,875	77,675	105,750	129,375
Total Sales	$ 877,500	$1,552,500	$2,115,000	$2,581,500
Cost of Sales	137,829	243,851	332,203	406,418
Gross Sales Margin	$ 739,761	$1,308,649	$1,782,797	$2,181,082
Expenses:				
General and administrative	$ 173,502	$ 173,502	$ 258,876	$ 374,004
Promotion	40,365	71,415	97,290	119,025
Utilities	50,965	90,169	122,839	150,282
Repairs, maintenance and insurance	83,084	95,548	130,961	161,512
Depreciation	131,673	211,586	305,635	393,781
Departmental salaries and wages	194,471	314,146	468,726	628,293
Payroll and other taxes and licenses	11,714	19,043	28,472	38,087
Other departmental expenses	102,234	162,740	226,834	284,409
Total Expenses from operations	$ 788,008	$1,138,149	$1,639,633	$2,122,393
Corps Fees	33,711	62,615	81,661	95,539
Total Expenses	$ 821,719	$1,200,764	$1,721,294	$2,217,932

TABLE 6 (Continued)

Item	Size (lodge rooms) 50	100	150	200
Income (Loss) Before Interest and Taxes	($ 82,048)	$ 107,885	$ 61,503	($ 36,850)
Income Taxes (48%)	0	51,785	29,521	0
Net Income (loss)	($ 82,048)	-$ 56,100	$ 31,982	($ 36,850)
Return on Investment (%)	-4.1	1.7	0.7	-0.6
Net Cash Flow (Net Income Plus Depreciation	$ 49,625	$ 267,686	$ 337,617	$ 356,931
Interest Cost with 100% Financing at 10.5% of Long-Term Fixed Assets	$ 176,649	$ 286,910	$ 413,306	$ 532,783
Income (loss) before Taxes Less Interest Cost	($ 276,366)	($ 179,025)	($ 351,803)	($ 568,633)
Net Cash Flow with Debt Capital	(-$ 127,024)	$ 140,446	(-$ 46,168)	(-$ 175,816)

*Rooms sales are based on an average of two persons per room, with a double room rate of $30.00 per day.

Cash flow estimates are shown in Table 6 for resorts both with and without debt capital financing. It is significant that positive cash flows are projected for all four sizes of resorts when financed by equity capital, and for the 100-room facility even with over 80 per cent debt financing. It is believed that many government (whether state or federal) concessionaires tend to be most concerned with short-run results which are reflected better by cash flow, and fail to provide adequate cash reserves for depreciation. Thus, many concessionaire-operated public facilities which appear to be successful initially deteriorate in both quality and services after several years of operation. In the cases examined here, this might easily become a reality to the less-sophisticated operator, or to one who had intentions of collecting short-run gains and selling out before capital replacement needs become too apparent.

Operating Results -- Shortened Season

Some resort-type facilities, especially those on government lands, operate only on a seasonal basis, i.e., 6 to 11 months per year. The effects of running the Upper Corner Lodge on a 6-month (April-September), or a 9-month (April-December), basis are shown in Table 7 for the three larger configurations studied. Underlying assumptions for these projections include no change in capital investment for the shorter seasons of operation and no change in management salaries and insurance. Most of the expenses were assumed to vary in proportion to the level of business (sales), although a few, e.g., maintenance and repairs, were assumed to be reduced by a lesser proportion than sales, since portions of such functions would have to be carried out on a year-round basis.

Length of season has some significant effects on operating results. The 100-room facility would clearly be most profitable if operated on a 12-month basis, with income falling dramatically for 6- and 9-month seasonal operations. However, as size increases, and average occupancy falls, the optimal season length becomes shorter. For a 150-room facility, the difference between 9- and 12-month operation incomes is nominal.

TABLE 7

EFFECTS OF 6-, 9-, AND 12-MONTH SEASONS OF OPERATION ON THE UPPER CORNER LODGE

Resort Size (Number of lodge rooms)	Length of Season (Months) 6, April-Sept.	9, April-Dec.	12 months
	Income (loss) before Interest and Taxes		
100 Rooms	$ 33,192	$ 89,597	$107,885
150 Rooms	($ 7,601)	$ 52,001	$ 61,503
200 Rooms	($ 65,957)	($ 26,749)	($ 36,850)
	Net Income (loss)		
100 Rooms	$ 17,260	$ 46,590	$ 56,100
150 Rooms	($ 7,601)	$ 27,041	$ 31,982
200 Rooms	($ 65,957)	($ 26,749)	($ 36,850)
	Net Cash Flow		
100 Rooms	$228,846	$258,176	$267,686
150 Rooms	$297,764	$332,676	$337,617
200 Rooms	$327,824	$367,032	$356,931

If a 200-room facility were constructed, it appears that a 9-month season of operation would produce better results, although a net operating loss of nearly $27,000 still is projected.

Cash flows follow the same pattern as net income for varying season lengths. As was discussed earlier, substantial positive cash flows would be developed for all size facilities and lengths of season, with the largest, $367,000, occurring for 9-month operation and a 200-room lodge.

CONCLUSIONS AND RECOMMENDATIONS

The preceding analysis and discussion leads to a general conclusion that is somewhat different from and more definite than the paradoxical findings of the Seven Points Marina study, where it appeared that demand was not likely to be sufficiently high to afford the development of a sufficiently large facility to achieve necessary economies of scale. In this case, it appears that a resort/lodge complex providing approximately 100-150 double occupancy lodge rooms would be able to reach a profitable level of operation under existing market and demand conditions.

Profit projections are small, indeed, and appear to be below the level that would normally be attractive to equity investors. However, it must be emphasized that these projections are based on current and short-run expectations of demand in the Raystown Lake region. As the area develops greater visibility among pleasure travelers, and as more attractions and larger facilities are added to the region, Upper Corner Lodge should grow in popularity and show improving operating results.

Moreover, the variables which were not independently evaluated, especially management ability and experience, could have a dramatic effect on the resort's profitability. One factor which will be particularly significant will be the degree to which off-season sales and occupancy can be raised above average levels for resorts. The development of convention and meeting business, or perhaps winter sports clientele, could be the key to actual success by a concessionaire at Upper Corner.

It seems clear from this study that a year-round facility is the only reasonable way to operate Upper Corner Lodge. Thus, the comments in the preceding paragraph take on added significance. However, for this concept to be successful, it is equally clear that cooperation from both the Corps and the regional and state governments will be critical. Actual visits to Raystown Lake, even in the summer months, suggest that highway access to Upper Corner is marginally acceptable. If winter conditions are such that visitors experience great uncertainity about access-ability, e.g., if roads remain untreated and unplowed for extended periods, the effect on operating results could be calamitous.

Experience in the travel and tourism industry indicates that much of the ability of entrepreneurs to develop new or improved facilities depends on the availability of debt financing. The risks associated with such businesses are such that they are not attractive to equity investors. Projections for the Upper Corner Lodge/Resort indicate that interest costs, at normal current rates (10.5 per cent was assumed) would exceed short-run profit expectations. Low interest loans from regional or national development agencies could make a significant difference.

Finally, it is likely that both the Upper Corner Lodge and the Seven Points Marina could achieve operational economies if they were under common management. Because of their reasonably close proximity and overlapping markets, many administrative, maintenance, and operational economies could accrue through the cost sharing of a number of functions.

APPENDIX B-1

RESORT HOTEL QUESTIONNAIRE

1. Please check which of the following activities you provide for your guests [check as many as apply, but only those owned and/or operated by your organization.]

a.	Snow skiing ____	d.	Golf ____
b.	Water recreation ____	e.	Tennis ____
c.	Health spas ____	f.	Other [please specify] ____

2. How many rooms and/or units do you have available? _____

3. In what year was your facility constructed? _____

   a] What was the original construction cost of your facility? [If you don't have exact figures please estimate] $_____

   b] What would you estimate to be the present replacement cost of your facility? $_____

4. What was your room and/or unit occupancy rate* for the calendar year 1974? _____% If possible please break down your 1974 occupancy rate by quarters. [If you don't have exact figures please estimate.]

Occupancy rate for January-March	_____%
Occupancy rate for April-June	_____%
Occupancy rate for July-September	_____%
Occupancy rate for October-December	_____%

5. What is the average number of persons who occupy one room and/or unit? _____

6. What is the average length of stay for persons visiting your establishment? _____ days

7. Please estimate as closely as possible the percentage of your total sales attributable to each of the following types of guests. (Although guests may have several reasons for coming, please estimate sales based on their main reason.)

Guests visiting for pleasure/vacation _____%
Guests visiting for conventions or meetings _____%
Guests visiting for other reasons _____%

8. Please estimate as closely as you can the percentage of your total sales derived from the following activities.

Room sales _____%
Food & beverage sales _____%
Recreational facilities fees _____%
(e.g., golf course, boat rentals)

9. Please estimate as closely as possible the percentage of your guests who had to drive the following distances to reach your facility.

_____% who drove less than 1 hour
_____% who drove less than 2 hours
_____% who drove less than 3 hours
_____% who drove over 3 hours

$$\text{*Occupancy rate percentage} = \frac{\text{Total number of room nights sold}}{(\text{Total number of rooms or units}) \times (\text{number of days per year open})} \times 100$$

The total number of room nights sold is one or more persons occupying one room or unit for one night.

[] Please furnish summary of findings NAME:_____

ADDRESS:_____

_____

_____

APPENDIX B-2

LETTER TO NATIONAL TRAVEL LODGINGS FRANCHISERS

West Virginia University | MORGANTOWN, WEST VIRGINIA 26506

Bureau of Business Research

The effects of the energy/fuels shortages, inflation, and reduced population growth rates are hard to measure, much less predict with accuracy. But, these effects may be profound for the travel and tourism industry. The Bureau of Business Research at West Virginia University is engaged in a research project to determine the principal criteria for profitability in one important segment of this industry...motels and resort hotels. This information may in turn help in dealing with problems such as those described above.

[Name of organization], as a leader in the industry which has vast experience, could contribute materially to our ability to develop meaningful guidelines for present and future travel lodging business. We would greatly appreciate your sending any information on the criteria that you use in site selection and construction cost estimates. Information or a model pertaining to regional demand estimation would also be very helpful.

Any information that you do provide will be kept in the strictest confidence. It will be used in developing guidelines. We will be happy to send you the results of our research at your request.

If you have any questions, please do not hesitate to call me at (304) 293-6371, extension 203.

Your assistance in this project is appreciated.

Sincerely,

Sue A. Mattson
Research Assistant

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