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To the Graduate Council:

I am submitting herewith a dissertation written by Julian Elery Holmes entitled "Costs and Returns from Golf Course Operations in Tennessee and Socioeconomic Factors Affecting Participation Rates in Golf." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Agricultural Economics.

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COSTS AND RETURNS FROM GOLF COURSE OPERATIONS IN TENNESSEE AND SOCIOECONOMIC FACTORS AFFECTING PARTICIPATION RATES IN GOLF

A Dissertation

Presented to

the Graduate Council of

The University of Tennessee

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

---

by

Julian Elery Holmes

March 1971

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975367

Failure to mention anyone who contributed to the success of this study does not indicate any lack of gratitude.

ABSTRACT

This study was designed to achieve the following objectives: (1) to determine the costs and returns associated with urban and rural golfing facilities in Tennessee; and (2) to identify and evaluate socioeconomic factors affecting participation in golf on urban and rural courses in Tennessee.

Data on costs and returns were obtained on nine 18 hole and four 9 hole urban golf courses located in the major metropolitan areas of Tennessee and on 10 nine hole rural golf courses located in rural communities with a population of 5,500 or less. Data on participation rates and socioeconomic factors were obtained from 1,796 golfers playing the urban courses and 525 golfers playing the rural courses. Regression techniques were used to analyze the effect of the socioeconomic variables on annual participation in golf.

Capital investment per golf course for the nine 18 hole urban courses averaged $494,309. Construction costs accounted for 50 percent of the total capital invested, land costs, 39 percent, and equipment costs, 11 percent. For the four 9 hole urban courses, total capital investment per course was $302,988. Land costs accounted for 56 percent of the total capital invested, construction costs, 37 percent, and equipment costs, 6 percent. Capital investment for the 10 nine hole rural golfing associations averaged $183,559. Construction costs accounted for 73 percent of the total capital invested, land costs, 17 percent, and equipment costs, 10 percent.

Annual operating costs for the nine 18-hole urban golf courses averaged $110,123 per course. Variable costs accounted for 89 percent and fixed cost 11 percent of the annual operating costs. For the four 9 hole urban courses, annual operating costs averaged $57,999 per course. Variable costs accounted for 91 percent and fixed costs 9 percent of the annual operating costs. Annual operating costs for the 10 nine hole rural golfing associations averaged $34,869 per association. Variable costs accounted for 66 percent and fixed costs 34 percent of the annual operating costs.

Annual gross income for the urban golf courses averaged $150,000 per course for the 18 hole courses and $61,640 per course for the nine hole courses. The daily green fee ticket was the principal source of income for all urban courses. Annual gross income for the 10 nine hole rural golfing associations amounted to $39,691 per association. Annual membership dues were the principal source of income for these associations and accounted for 67 percent of the annual gross income.

Net income from the operation of the nine 18 hole urban golf courses averaged $40,867 per golf course, or 8.2 percent return on capital investment. Net income for the four 9 hole urban courses averaged $3,641 per golf course, or a 1.2 percent return on capital investment. For the 10 nine hole rural golfing associations, net income averaged $4,822 per association, or a 2.6 percent return on capital investment.

The user demand model used to explain variations in annual participation rates in golf produced results that, in general, were

below expectation. The independent variables specified in the model accounted for only 11 percent of the variation in annual participation rates on municipal courses in the Memphis area, 14 percent in Nashville, 17 percent in Knoxville, and 29 percent in the Johnson City area. Only 10 percent of the variation in participation rates on the rural golf courses was explained by the variables included in the model. The analysis, however, identified a number of socioeconomic variables which significantly influenced annual participation rates. These variables were age, education, income, the price of the golfing unit, and occupation.

TABLE OF CONTENTS

CHAPTER		PAGE
I.	INTRODUCTION	1
	The Problem	1
	Objectives	7
	Source of Data	7
	Rural sector	8
	Urban sector	9
	Sampling Procedure for Primary Data	9
	Rural sector	11
	Urban sector	12
II.	THEORETICAL CONSIDERATION	13
	Economic Framework	13
	Quantity of golf demanded	16
	Price of the golfing experience	19
	Dollar costs	20
	Travel costs	21
	Time costs	23
	Tastes and preferences	26
	Socioeconomic characteristics	27
	Income	29
	Occupation	32
	Leisure	36
	Age	39

CHAPTER PAGE

Education 39
Sex 39
Substitutes and complements 39
Economic Model: User Demand Function 40
Statistical Considerations 43
Regression analysis 43
Stepwise regression 46
Dummy variables 46
Elasticity 50
III. COSTS AND RETURNS 51
Variable and Fixed Costs 51
Variable costs 51
Maintenance costs 51
Golf supplies and food costs 52
Fixed costs 52
Depreciation 53
Interest 53
Other 53
Urban Golf Courses 54
Characteristics 54
Physical 54
Financial 54
Managerial 56
Capital investments 57

CHAPTER PAGE

Land 57
Construction costs 57
Equipment costs 73
Capital investment summary 75
Annual operating costs 78
Variable costs 78
Fixed costs 86
Annual gross income 87
Green fees 88
Rental fees 90
Golf shop 90
Snack bar 90
Net returns to capital 91
Rural Golf Courses 91
Characteristics 94
Physical 94
Financial 94
Managerial 96
Capital investments 97
Land 97
Construction costs 99
Equipment costs 108
Capital investment summary 108
Annual operating costs 108

CHAPTER PAGE

Variable costs 111
Fixed costs 115
Annual gross income 116
Membership dues 116
Green fees 118
Rental fees 118
Golf shop 119
Snack bar 119
Swimming pool 119
Miscellaneous 120
Net returns to capital 120
IV. ANALYSIS OF PARTICIPATION IN GOLF 122
Urban Sector 123
Memphis municipal courses 124
All golfers 125
Weekday golfers 132
Weekend golfers 133
Before 4:00 p.m. golfers 135
After 4:00 p.m. golfers 136
Nashville municipal courses 138
All golfers 138
Weekday golfers 144
Weekend golfers 146
Before 4:00 p.m. golfers 147

CHAPTER PAGE

After 4:00 p.m. golfers 149
Knoxville municipal course 151
All golfers 151
Weekday golfers 156
Weekend golfers 158
Before 4:00 p.m. golfers 160
After 4:00 p.m. golfers 161
Johnson City municipal course 162
All golfers 162
Weekday golfers 167
Weekend golfers 167
Before 4:00 p.m. golfers 168
After 4:00 p.m. golfers 169
Rural Sector 170
All golfers 170
Weekday golfers 177
Weekend golfers 178
Before 4:00 p.m. golfers 180
After 4:00 p.m. golfers 181
Member golfers 181
Nonmember golfers 183
Statewide Analysis 184
V. SUMMARY 200
Costs and Returns 201
Analysis of Participation in Golf 205

CHAPTER PAGE

LITERATURE CITED 209

APPENDIXES 212

Appendix A 213

Appendix B 217

Appendix C 227

Appendix D 230

Appendix E 234

Appendix F 235

VITA 236

CRANES CREST

LIST OF TABLES

TABLE		PAGE
I.	Number of Regulation Golf Facilities by Type, Par Three Golf Facilities and Ratio of Facilities to Population for Eleven Southern States, 1969	4
II.	Projected Number of Additional 9 and 18 Hole Golf Courses Needed in Tennessee to Year 2000, 1968	6
III.	Physical Characteristics of 13 Urban Golf Courses, Tennessee, 1969	55
IV.	Number of Acres, Estimated Initial Cost and Present Market Value of Land Used, 13 Urban Golf Courses, Tennessee, 1969	58
V.	Estimated Total Construction Costs per Course, 13 Urban Golf Courses, Tennessee, 1969	60
VI.	Estimated Size, Construction Cost and Annual Depreciation of Buildings and Ancillary Facilities, Nine 18 Hole Urban Golf Courses, Tennessee, 1969	62
VII.	Estimated Size, Construction Costs and Annual Depreciation of Buildings and Ancillary Facilities, Four 9 Hole Urban Golf Courses, Tennessee, 1969	65
VIII.	Estimated Size and Construction Costs of Putting Greens, 13 Urban Golf Courses, Tennessee, 1969	67
IX.	Estimated Size and Construction Cost of Tees, 13 Urban Golf Courses, Tennessee, 1969	69

TABLE PAGE

X. Estimated Size and Construction Costs of Fairways and Hazards, 13 Urban Golf Courses, Tennessee, 1969 71

XI. Estimated Cost per Unit of Equipment, Total Costs and Annual Depreciation for Major Items of Equipment Used in the Operation of Nine 18 Hole Urban Golf Courses, Tennessee, 1969 74

XII. Estimated Costs per Unit of Equipment, Total Costs and Annual Depreciation for Major Items of Equipment Used in the Operation of Four 9 Hole Urban Golf Courses, Tennessee, 1969 76

XIII. Summary of Estimated Capital Investment per Golf Course, 13 Urban Golf Courses, Tennessee, 1969 77

XIV. Annual Operating Cost per Golf Course, 13 Urban Golf Courses, Tennessee, 1969 79

XV. Labor Characteristics and Estimated Labor Costs, 13 Urban Golf Courses, Tennessee, 1969 81

XVI. Estimated Annual Gross Income, Four 9 Hole and Nine 18 Hole Urban Golf Courses, Tennessee, 1969 89

XVII. Estimated Gross Income, Annual Operating Costs and Net Returns per Golf Course, 13 Urban Golf Courses, Tennessee, 1969 92

XVIII. General Population Characteristics of the Counties in Which the 10 Rural Golfing Associations Studied Were Located, Tennessee, 1969 93

TABLE PAGE

XIX. Physical Characteristics of 10 Rural Golf Courses, Tennessee, 1969 95

XX. Number of Acres, Estimated Initial Cost and Present Market Value of Land Used for 10 Rural Golfing Associations, Tennessee, 1969 98

XXI. Estimated Total Construction Costs per Association, 10 Rural 9-Hole Golfing Associations, Tennessee, 1969 . . 100

XXII. Estimated Size, Construction Cost and Annual Depreciation of Buildings and Ancillary Facilities, 10 Rural Golfing Associations, Tennessee, 1969 101

XXIII. Estimated Size and Construction Cost of Golf Courses, 10 Rural Golfing Associations, Tennessee, 1969 105

XXIV. Estimated Costs per Unit of Equipment, Total Costs and Annual Depreciation for Major Items of Equipment Used in the Operation of 10 Rural Golfing Associations, Tennessee, 1969 109

XXV. Summary of Estimated Capital Investment per Golfing Association, 10 Rural Golfing Associations, Tennessee, 1969 110

XXVI. Annual Operating Costs per Golfing Association, 10 Rural Golfing Associations, Tennessee, 1969 112

XXVII. Labor Characteristics and Estimated Labor Costs per Golfing Association, 10 Rural Golfing Associations, Tennessee, 1969 113

TABLE PAGE

XXVIII. Estimated Annual Gross Income for 10 Rural Golfing Associations, Tennessee, 1969 117

XXIX. Estimated Gross Income, Annual Operating Costs and Net Returns per Golfing Association, 10 Rural Golfing Associations, Tennessee, 1969 121

XXX. Empirical Results of User Demand Model Used in the Analysis of 771 Golfers Sampled on Two Municipal Golf Courses in Memphis, Tennessee, 1969 126

XXXI. Empirical Results of User Demand Model Used in the Analysis of 614 Golfers Sampled on Two Municipal Golf Courses in Nashville, Tennessee, 1969 139

XXXII. Empirical Results of User Demand Model Used in the Analysis of 254 Golfers Sampled on the Municipal Golf Course in Knoxville, Tennessee, 1969 152

XXXIII. Empirical Results of User Demand Model Used in the Analysis of 157 Golfers Sampled on the Municipal Golf Course in Johnson City, Tennessee, 1969 163

XXXIV. Empirical Results of User Demand Model Used in the Analysis of 525 Golfers Sampled on 10 Rural Golf Courses in Tennessee, 1969 171

XXXV. Comparison of Empirical Results Obtained from the User Demand Models, for all Golfers Sampled on the Urban Municipal Golf Courses, Rural Semiprivate Golf Courses and in the Statewide Survey, Tennessee, 1969 185

TABLE PAGE

XXXVI. Distribution of Average Annual Participation Rates in Golf, by Sample Types, Eight Recreation Regions in Tennessee, 1969 193

XXXVII. Distribution of Average Annual Participation Rates in Golf, by Family Income, Eight Recreation Regions in Tennessee, 1969 195

XXXVIII. Distribution of Average Annual Participation Rates in Golf, by Age of the Head of the Sample Unit, Eight Recreation Regions in Tennessee, 1969 196

XXXIX. Distribution of Average Annual Participation Rates in Golf, by Years of Formal Education of the Head of the Sample Unit, Eight Recreation Regions in Tennessee, 1969 197

XL. Distribution of Average Annual Participation Rates in Golf, by Occupation of the Head of the Sample Unit, Eight Recreation Regions in Tennessee, 1969 198

XLI. Number of Golf Courses by Population Groupings of Cities With an Average of People Served by Type of Golf Course, Tennessee, 1969 213

XLII. Estimate of Purchase Price, Average Investment, Salvage Value, Annual Depreciation, Useful Life and Annual Repair Costs for Selected Items of Equipment Used in the Operation of a Golf Course 230

TABLE PAGE

XLIII. Maintenance Cost per Golf Hole, by Geographical Divisions, for 50 Country Clubs as Reported by the National Golf Foundation, 1966-67 234

LIST OF FIGURES

FIGURE		PAGE
1.	Location by Counties of the Rural and Urban Golf Courses Included in the Sample, Tennessee, 1969	10
2.	Demand Curve	15
3.	Indifference Curve	28
4.	Effect of Change in Income on Expenditures for Food	31
5.	Effect of Change in Income on Expenditures for Golf	33
6.	Backward Bending Supply Curve of Labor	38
7.	Occupational Effect on the Intercept Level of the Regression Equation	48
8.	Recreation Regions in Tennessee	235

CHAPTER I

INTRODUCTION

Recreation is one of the most important services produced in the United States. Americans are investing at a rate of $83 million annually in recreational activities and in 1969 total expenditures for the leisure industry exceeded annual outlays for national defense.[1] One of the fastest growing recreational activities is golfing. The National Golf Foundation reports that from 1957 to 1968, the number of persons participating in golf increased from 3,812,000 to over 9,000,000, an increase of 136 percent. During the same period, the number of golf courses increased from 5,553 to 8,990, or 62 percent.[2] The importance of golf as a major recreational activity becomes even more apparent when capital investments, land acreages and sales of golfing equipment and supplies are considered.

I. THE PROBLEM

Clawson and Knetsch[3] assert that "in some ways the study of demand for outdoor recreation today is about where the study of demand

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[1]Hugh A. Johnson, "The Role of Recreation in Our Play-Oriented Society" (Paper presented at the American Society of Agricultural Engineers, University of Mississippi, Oxford, November 14-15, 1969), p. 1.

[2]National Golf Foundation, Organizing and Operating Public Golf Courses (Chicago: National Golf Foundation, 1967), p. 6.

[3]Marion Clawson and Jack L. Knetsch, Economics of Outdoor Recreation (Baltimore: The Johns Hopkins Press, 1966), p. 63.

for agricultural commodities was 40 years or more ago . . ." When one reviews the literature of outdoor recreation, the validity of this statement becomes apparent. Recreational researchers, like the early agricultural economists, have been groping with a wide range of methodological and data problems. Consequently, recreational research has been characterized by a lack of discernible trends and clear cut objectives. A maze of literature, therefore, has emerged in rather chaotic fashion. Much of what has been written has been concerned with the analysis of social and economic processes in only a limited way and has evolved largely from the emotional and sentimental attitudes associated with outdoor recreation. Impending pressures on resource use during the last few years, however, has focused widespread attention on the need for a more theoretical treatment of outdoor recreation. Emphasis has centered largely on the allocation of natural and human resources within the economic framework of supply and demand analyses.

The immediate problem is a lack of data. Little information is available concerning the supply and demand of recreational activities such as golfing. From the demand side, the National Golf Foundation estimates that on the basis of expected population growth alone, it is doubtful that there will ever be enough golf courses to meet the demand.[4] This fact, together with changing social patterns, such as increased urbanization, higher per capita incomes, shorter work weeks and increased life spans, have added new and serious dimensions to the demand for golf.

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[4]National Golf Foundation, loc. cit.

Existing golf facilities have been unable to meet adequately the demands of the public. As a result, many golf courses have deteriorated and have experienced a loss of quality in their facilities.

The problem is most acute in the metropolitan areas. Existing municipal golf courses in such areas account for only 13 percent of the country's total golf courses, but are handling over 40 percent of the nation's golf play.[5] In Tennessee, municipal golf courses account for 12 percent of total golfing facilities (Table I). The problem may become even more acute in the future as indicated in the specific findings of a nationwide study of outdoor recreation by the Outdoor Recreation Resource Review Commission (ORRRC). According to the ORRRC:

> Three-quarters of the people will live in these areas by the turn of the century. They will have the greatest need for outdoor recreation, and their need will be the most difficult to satisfy as urban centers have the fewest facilities (per capita) and the sharpest competition for land use.[6]

Economic research at the metropolitan level to meet these emerging demands has been practically nonexistent. Agencies administering golf courses have not been authorized, staffed or financed to conduct such research. Their primary concern has been with administrative and managerial problems. As a result, there has been a serious lack of facts and understanding of the variables influencing the demand for golfing services.

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[5] Ibid., p. 2.

[6] Outdoor Recreation Resource Review Commission, Outdoor Recreation for America (Washington, D.C.: U. S. Government Printing Office, January, 1962), p. 3.

TABLE I

NUMBER OF REGULATION GOLF FACILITIES BY TYPE, PAR THREE GOLF FACILITIES AND RATIO OF FACILITIES TO POPULATION FOR ELEVEN SOUTHERN STATES, 1969

State	Regulation Golf Facilities										Total Par Three Golf Facilities	Ratio Golf Facilities to 1969 Population
	Private			Semi-Private			Municipal					
	9	18	Total	9	18	Total	9	18	Total	Total		
Alabama	65	41	106	16	6	22	3	6	9	137	12	23,698
Arkansas	39	18	57	29	6	35	4	3	7	99	4	19,350
Florida	25	108	133	28	98	126	9	28	37	296	68	17,456
Georgia	79	59	138	28	13	41	9	13	22	201	13	21,687
Kentucky	59	35	94	25	11	36	19	9	28	158	14	18,791
Louisiana	46	29	75	10	8	18	9	6	15	108	2	34,027
Mississippi	56	30	86	4	5	9	4	2	6	101	4	22,476
North Carolina	51	101	152	54	62	116	8	8	16	284	27	16,736
South Carolina	35	56	91	18	29	47	1	1	2	140	17	17,146
Tennessee	49	40	89	28	12	40	6	14	20	149	11	24,906
Virginia	59	73	132	20	24	44	2	4	6	182	18	23,345
South	563	590	1,153	260	274	534	74	94	168	1,855	190	

Source: National Golf Foundation, Organizing and Operating Public Golf Courses (Chicago: National Golf Foundation, 1969), pp. 4-7.

Demand data concerning the urban golfing public are needed to provide an economic basis for guidance in formulating decisions. For example, policymakers and municipal planners need established demand relationships between participation rates and socioeconomic variables to provide a basis for projection of future demand. Such projections, however, cannot be made adequately without an appraisal of existing facilities and associated supply variables. Availability of capital, land and management may impede development of courses even where there are increases in demand. As Table I, page 4, shows, Tennessee ranks fifth among the 11 southern states in the number of existing regulation golf facilities, but tenth in the ratio of facilities to population. Furthermore, a 1968 study conducted by the Tennessee Department of Conservation of the supply and demand of recreational facilities in Tennessee showed that the need for golfing facilities will be much greater in the future (Table II). The study compared the need for (N) or idle capacities (I) for golfing resources and facilities. Conclusions showed that by the year 2000, Tennessee will need 95 additional 9 hole courses and 67 18 hole courses.

Costs and returns data are needed to provide an economic basis for meeting such future demands. Reliable data are needed concerning construction costs, operating costs, managerial characteristics, and sources of annual income for both 9 and 18 hole golf courses.

Within recent years, the impending urban pressures on municipal courses have been somewhat reduced by the development of golf courses in the outlying rural areas by private and public investors. Very little

TABLE II

PROJECTED NUMBER OF ADDITIONAL 9 AND 18 HOLE GOLF COURSES NEEDED IN TENNESSEE TO YEAR 2000, 1968

Year	9 Hole	18 Hole
1967	25I	14I
1973	14I	8I
1980	21N	17N
1990	55N	38N
2000	95N	67N

Source: Tennessee Recreation Survey, Tennessee Statewide Comprehensive Outdoor Recreation Plan - 1969, MRI Report No. 3174-D (Nashville: Tennessee Department of Conservation, September, 1969), p. 35.

data exists, however, about the economic success of these investments. Data similar to that available for urban areas are needed in order to compare supply and demand relationships for these two sectors.

II. OBJECTIVES

The broad objectives of this analysis were to study urban and rural golfing facilities in Tennessee and their patrons. Specific objectives were:

1. To determine the costs and returns associated with urban and rural golfing facilities in Tennessee; and
2. To identify and evaluate socioeconomic factors affecting participation in golf on urban and rural courses in Tennessee.

III. SOURCE OF DATA

The appropriate source of data depends primarily on the objectives of the investigation. Since the broad objectives were an analysis of both urban and rural oriented golf, it was decided to delineate the two sectors on the basis of the 1960 Census definition of rural-urban residences.[7] The management and patrons of golf courses in these two sectors provided the primary data.

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[7]The 1960 United States Census of Population adopted the definition of rural-urban residences on the basis of population. According to the Census, an urban population is comprised of all persons living in incorporated places of 2,500 inhabitants or more. For a breakdown of the number and types of golf courses in Tennessee by population of cities, see Appendix A.

Secondary data were used extensively. The principal source was a study of the supply and demand of 44 different recreational activities conducted by the Tennessee Department of Conservation.[8] From the supply side, the management of golf courses throughout the state was inventoried in this study and the physical characteristics of the golf courses were described. From the demand side, 2,811 family units were interviewed on a random sample basis and data were obtained on participation rates in golf and on the socioeconomic characteristics of the family units. The family-unit survey included approximately 9,800 persons. The sample was collected in mid-June of 1968. The sample was structured to include respondents by counties, cities, including Standard Metropolitan Statistical Areas, non-Standard Metropolitan Statistical counties, and recreational regions.

Rural Sector

Since the 1962 Food and Agriculture Act was passed, the Farmers Home Administration (FHA) in Tennessee has helped finance over 20 recreational associations which include golf as the major recreational activity. The major prerequisite for obtaining financial assistance for developing such a recreational (golfing) association was that the association be developed within a rural environment with a population of 2,500 or less. This stipulation was changed in 1965 to include rural communities with populations of 5,500 or less. Of the 20 golfing

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[8]Tennessee Recreation Survey, Tennessee Statewide Comprehensive Outdoor Recreation Plan - 1969 (Nashville: Tennessee Department of Conservation, September, 1969).

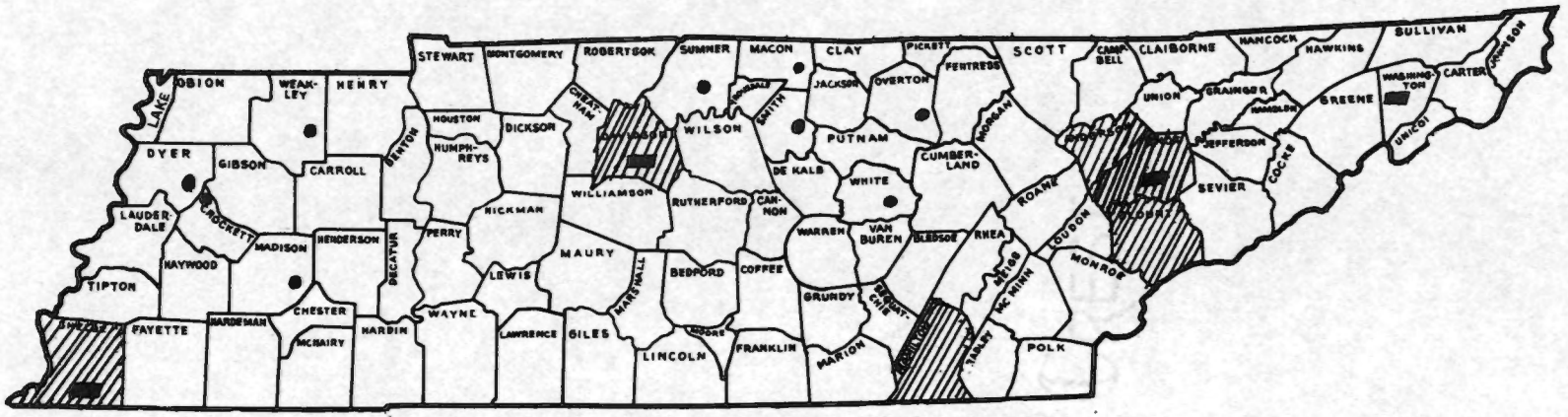
associations financed by the FHA in Tennessee since 1962, 10 have been in operation for one year or longer. These 10 courses represent 31 percent of the golf courses in the state open to the public in communities of 2,500 or less. All 10 FHA financed courses in the state operating for more than one year were included in the study. The location of these 10 rural courses is shown by counties in Figure 1.

Urban Sector

The majority of golf in Tennessee is played in the urban areas. Forty-eight, or 27 percent, of all golf courses in the state are located in the four Standard Metropolitan Statistical Areas (Figure 1). Of these 48 courses, 17 are municipally operated, 6 are semiprivate, 23 are private and 2 are located on military installations (Appendix A). To provide a basis for study of golf in the urban sector, all municipally operated courses in Shelby, Knox and Davidson counties were included in the study; also, an additional municipal course located in Washington county was included. Thus, 13, or 57 percent, of the municipally operated golf courses in the state were included in the study. The location of these 13 urban courses is shown by counties in Figure 1. Urban semiprivate and private golf courses were not included in the study because of difficulties that would be encountered in obtaining an adequate cross section of the urban golfing public.

IV. SAMPLING PROCEDURE FOR PRIMARY DATA

Few recreational studies have investigated both the supply and demand aspects of specific recreational activities. However, theory



● Rural Golf Courses

■ Urban Golf Courses

▨ Standard Metropolitan Statistical Areas with 250,000 or More

Figure 1. Location by counties of the rural and urban golf courses included in the sample, Tennessee, 1969.

suggests that variables affecting both supply and demand are closely related (the identification problem) and that such variables should be included in the analysis in order to provide a proper perspective and to prevent inherent biases. Two questionnaires were devised for gathering primary data: (1) Questionnaire A was designed to obtain cost and returns information and other information related to the supply of golf, and (2) Questionnaire B was designed to obtain demand information from the patrons who actually played the course. (See Appendixes B and C.)

Rural Sector

Costs and returns data were obtained by personal interviews with personnel of the FHA, golf course managers and related officials of the golfing association. The interviews were conducted at the offices of FHA agents, the golf course and in some cases the homes of these individuals. The data were obtained during the months of November and December of 1969.

Demand data were obtained by asking the golf course managers or some person closely affiliated with the association to hand out Questionnaire B to all golfers as they entered the clubhouse. The golfers were asked to complete the questionnaire in the clubhouse at their convenience before or after they finished play. In some cases the golfers were allowed to take the questionnaire home and return it later since the person handing out the questionnaire was asked to repeat the above process for seven consecutive days. This procedure was followed during normal working hours. The person handing out the questionnaire was paid 25 cents for each questionnaire that was completed. Using this sampling technique, 525 questionnaires were completed. The data were collected during October and November, 1969.

Urban Sector

Costs and returns data were obtained by personal interviews with officials of the municipalities where the sample courses were located, the professional golf course managers and the greens superintendents. In most cases the interviews were conducted at the municipal golf courses and lasted about two hours. This survey was completed during September and October of 1969.

Demand data were obtained from golfers using the municipal courses by stationing a trained interviewer at or around the first tee. The golfers were asked, as they approached the first tee, to complete Questionnaire B. In some instances, the golfers preferred to fill out the questionnaire after play was completed. Because of the number of players on the municipal courses, it was difficult to determine the number of golfers that were not interviewed on a particular day. Periodic checks, however, showed that about 47 percent of the weekday golfers and 63 percent of the weekend golfers were interviewed.

To obtain a cross section of the urban golfing public playing these municipal courses, the sampling process was repeated for seven consecutive days. Using this procedure, 1,796 golfers, or an average of 469 golfers per course, completed the questionnaire.

CHAPTER II

THEORETICAL CONSIDERATIONS

I. ECONOMIC FRAMEWORK

There is no economic theory of recreation. Recreation, however, offers a product or service that is not fundamentally different from other products or services found in the market place. Further, the consumer is confronted with economic decisions concerning the purchasing of the product or service. Tangible expressions of these decisions are generally reflected in attendance figures. According to Clawson:

> . . . The people who chose to visit public outdoor recreation areas presumably weighed the costs of doing so against the costs of other goods or services they might have bought with the same money. Theirs was a personal choice, dependent in large measure upon their personal value scales and preferences, but conditioned also by many social factors in the society of which they are a part. . . .[1]

Within this framework, the theory of consumer demand provides an economic basis for this study since it deals with the actions and choices of the consumer in the market place whether he is a nonrecreationist or a recreationist. Thus, when the latter selects golf as a recreational activity, he acts as a consumer exercising his right of choice and allocation of time and money in an effort to maximize total satisfaction of his wants.

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[1]Marion Clawson and Jack L. Knetsch, Economics of Outdoor Recreation (Baltimore: The Johns Hopkins Press, 1966), p. 45.

Demand for a product or service, as defined by Leftwich, is the "various quantities of it which consumers will take off the market at all possible alternative prices, other things equal."[2] Such demand statements provide a basis for expressing varying reactions of consumers to the product or service. The traditional demand curve reflecting price and quantity relationships is depicted in Figure 2 with the vertical axis measuring price per unit and the horizontal axis measuring quantity of good or service per unit of time. In general, the higher the price of the good the less consumers will take, other things equal. Conversely, the lower the price of the good, the greater the amount taken by the consumers. This inverse relationship holds for most cases with exceptions occurring primarily in the area of snob appeal and where consumers judge quality chiefly by price.[3] An exclusive country club that might attract members at higher prices, provided certain aesthetic values are satisfied and first-rate recreational facilities are available, is an example of the latter.

The amount the consumer will take off the market, however, is affected by several factors other than price. These are: (1) tastes and preferences; (2) socioeconomic characteristics, and (3) the price or availability of substitute goods and (4) the price or availability of complementary goods. Thus, most theoretical demand curves have five

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[2]Richard H. Leftwich, The Price System and Resource Allocation (New York: Holt, Rinehart and Winston, 1965), p. 27.

[3]William J. Baumol, Economic Theory and Operations Analysis (New Jersey: Prentice-Hall, 1963), p. 170.

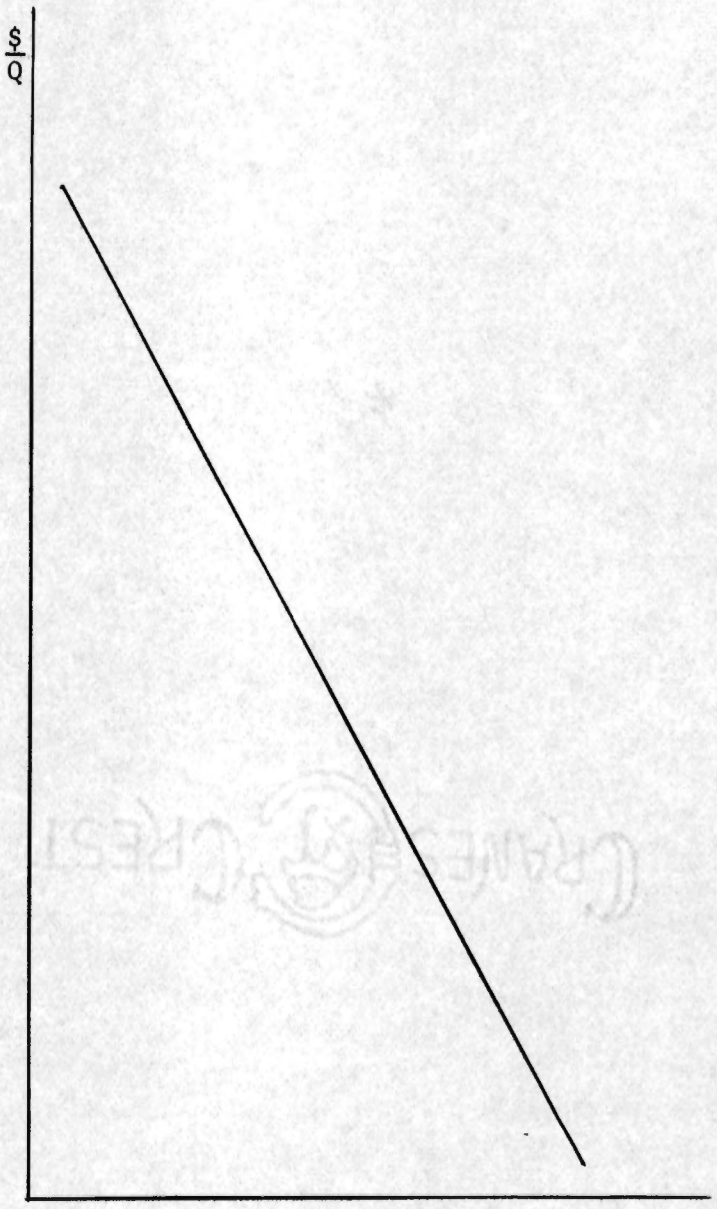


Figure 2. Demand curve.

principal determinants and a hypothesized demand curve for golfing might be stated as:

$$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + E \quad (1)$$

where:

Y = quantity of golf demanded

X_1 = price of the golfing service

X_2 = tastes and preferences

X_3 = socioeconomic characteristics

X_4 = price of substitute goods

X_5 = price of complementary goods

E = random error term

Providing empirical estimates of the parameters (the B's) of the demand curve above is a difficult task. Each determinant is influenced by a number of factors which are often difficult to isolate and measure. The following sections provide a theoretical framework for each variable in equation (1) and define the dependent variable and explanatory variables used in the economic model developed for this analysis.

Quantity of Golf Demanded

In traditional demand analysis, the concept of quantity demanded refers to the number of units of a commodity purchased at a certain price per unit. Implicit here is that the unit of commodity purchased or consumed must conform in some precise way to the unit priced. For most ordinary goods, the measurement of the unit of commodity purchased has been resolved by adopting units of weights, units of volume or other

physical or qualitative characteristics of the product. These conventional units, however, are not readily applicable as units of measurement for the demand for golf.

A characteristic of a golf course is that the product or service produced must be consumed at the golf course. That is, to utilize the product the consumer must travel to the golf course and thus consumption must necessarily occur at the point of production. One approach to measuring the unit of product purchased, therefore, would be to define the product in terms of units which identify it with the site at which it was produced and consumed.[4] For example, an investment in a golf course, in a very real sense, produces the capacity to accommodate participants. Participants, on the other hand, purchase a part of this capacity in the form of time. Since golf requires a great deal of time to play, anywhere from three to six hours, the unit of consumption may be thought of in terms of a user day. That is, each individual consumes a fraction of the capacity available in one day of use.[5]

Thus, in this study quantity demanded of golf was defined in terms of user days. It was determined by asking each individual golfer how many times he played the particular golf course in question during the past year. Thus, if he played the course 25 times, this was equivalent to 25 user days. This procedure provided a direct measure of the units

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[4]Outdoor Recreation Resources Review Commission, Economic Studies of Outdoor Recreation, ORRRC Study Report 24 (Washington: U. S. Government Printing Office, 1962), p. 6.

[5]It should be explicitly recognized that capacity of a golf course does not define uniquely the number of user days produced. A golf course may be utilized to varying degrees of intensity. For example, a person may play the course more than one time in a day.

of quantity purchased as the price of the golfing visits varied.

Milan[6] suggests that cautions should be observed in making estimates of demand using the measure of quantity as defined above. Conventional estimates of demand assume that the quantities associated with a series of prices are homogeneous. This implies that golfers have no reason for preferring one golf course over another if all courses are available at the same price.

In reality, however, the assumption of homogeneity of the quantities of golf available to the public is not always met because of product differentiation. Golfing activities are differentiated and compete with each other as well as with other products. As Chamberlin points out:

> Commodities are differentiated partly by their very nature and partly in response to differences in buyer's tastes, preferences, and location, which are as much a part of the order of things within any broad class of products as they are between one product and another product.[7]

Product differentiation among golf courses arises primarily from three sources. First, a golf course may have a particular mix of recreational and other activities so as to make it unique. Exclusive country clubs, for example, may offer a bar and dining facilities along with the golf course. Second, natural endowments of the golf course such as the scenic beauty and terrain may serve to differentiate the

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[6]R. L. Milan, "An Analysis of the Demand for Selected Golfing Services in the North Carolina Piedmont" (Unpublished Doctor's dissertation, North Carolina State University, 1968), pp. 13-14.

[7]Edward Hasting Chamberlin, The Theory of Monopolistic Competition (Cambridge, Massachusetts: Harvard University Press, 1960), p. 213.

product. Closely associated with this are differences in the actual playing conditions of the golf course. Finally, product differentiation may result from accessibility which is associated primarily with location of the golf course relative to concentrations of population.

The above discussion requires that two assumptions with respect to the quantity variable be made. First, it was assumed that the golf courses included in the analysis were similar in golfing facilities offered and natural endowment. Second, it was assumed that variation in accessibility was taken into account by the cost of transportation variable which is explained later in this chapter. The above assumptions are realistic when consideration is given to the type of courses studied. Exclusive country clubs and golf courses catering to the vacationing public were excluded from the sample. Those courses studied offered golf as the major recreational activity and their natural characteristics were very similar. Further, both the municipal and rural courses were located in such a way that they were readily accessible to the general public.

Price of the Golfing Experience

The price of a product represents the terms on which it may be acquired.[8] For most products the terms are expressed in dollars which are easily measured. Time and trouble are generally involved in the acquisition of the product. Traditional demand analysis, however, ignores or subsumes both under the term price.

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[8]George J. Stigler, The Theory of Price (New York: The Macmillan Company, 1966), p. 22.

In contrast, prices associated with golfing are difficult to isolate and measure. This is because the cost generally involves the total recreation experience. Clawson[9] delineates the total recreation experience into five distinct phases: (1) anticipation, (2) travel to, (3) on-site experience, (4) travel back and (5) recollection. As a result, three types of cost are associated with the total golfing experience. These are dollar costs, travel costs, and time costs.[10] From the standpoint of the total golfing experience, all three are often closely correlated. However, there are circumstances when they may diverge and exert a significant separate effect. As a result, all three measures are discussed separately.

Dollar costs. Dollar costs are the most easily measured and are generally incurred during the on-site experience phase of the total golfing experience. The two principal sources of dollar costs are green fees and cost of food and miscellaneous supplies. Green fees may vary significantly at a particular course depending on the green fee policy. For example, weekend rates are usually higher than weekday rates. In addition, green fees may also vary from course to course. Thus, green fees represent a direct cost to the golfer and were assumed to be a significant part of the price variable.[11]

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[9]Marion Clawson and Jack L. Knetsch, Economics of Outdoor Recreation (Baltimore: The Johns Hopkins Press, 1966), pp. 33-34.

[10]Ibid., p. 62.

[11]In the actual calculation of the price variable, variations in green fees were taken into account by utilizing the green fee charged the golfer for that particular day.

Costs of food and miscellaneous supplies, such as golf balls and tees, incurred during the on-site experience phase represent a cost to the golfer. However, such costs are rather incidental and difficult to allocate according to use. Food costs, for example, cannot be directly attributed to the golfing experience. Further, such costs are fairly constant from individual to individual and contribute little to variation in price. Therefore, the costs of food and miscellaneous supplies were assumed not to be a significant cost attributable to the golfing experience and were excluded from the price variable.

Travel costs. One of the unique characteristics of a golf course is its immobility. Thus, the golfer must transport himself to the point of supply or golf course before the on-site experience phase can occur. Moreover, the supply points for golf are distributed more sparsely than the supply points (e.g., the corner grocery store) for such ordinary goods as a loaf of bread. In general, such ordinary goods are transported to the consumer and the cost of transportation is incorporated into price in the form of production costs.

The distinction between the two types of goods takes on added importance with respect to the measurement of the demand for golf. The effect of travel costs may be illustrated by a comparison of supply and demand models for golfing and ordinary goods.[12] Model I refers to transportable goods, whereas Model II refers to golfing.

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[12] Economic Studies of Outdoor Recreation, p. 24.

Model I - Transportable Goods

Demand: $Q_d = a_{10} + a_{11}P$

Supply: $Q_s = a_{20} + a_{21}P + a_{22}m$

Q_d = quantity demanded

Q_s = quantity supplied

a = coefficient

b = coefficient

P = price

m = transportation

In Model I, m enters the supply function with a negative coefficient. This indicates that the farther the supplier from the demander, the lower the quantity that will be offered at a given price. The coefficient of the transportation variable, a_{22}, in this case reflects the effect of the variable unit transportation cost per unit distance.

Model II - Golfing Service

Demand: $Q_d = b_{10} + b_{11}P + b_{12}m$

Supply: $Q_s = b_{20} + b_{21}P$

In Model II, because of the immobility of a golf course, a different situation arises. The transportation variable, m, now enters the demand function with a negative value. This implies that the farther removed the golfer from the point of supply, the golf course, the smaller the quantity he stands ready to purchase at a given price.

The golfer, therefore, incurs a direct cost during the travel to and travel back phase of the total golfing experience. The implications

of this cost from the standpoint of demand analysis are implicit in Model II. The price as viewed by the golfers does not coincide with that of the course manager. Since it is the price as viewed by the golfers that determines demand, travel costs were therefore incorporated into the price variable to equate the two sides.

Travel costs were calculated for the travel to and travel back phase of the total golfing experience. A constant cost factor of $.10 per mile was assumed for the round trip. This assumption appears reasonable since all the sample courses were one day visit facilities. If the golfers traveled to the golf course in a group, travel costs were prorated equally among the individuals. Thus, if the green fees were $2.00 and four members in a group had driven 20 miles round trip to play golf, the price per individual was $2.50.

Time costs. Traditional consumer demand analysis ignores the cost of time. However, one of the major unresolved issues in the field of recreation is the question of the value of time spent during the total recreational experience. As Clawson[13] puts it, "Time has value and to ignore it in the cost of going to a recreation area may seem to invite gross error." Clawson asserts further, that the time required to travel should be of most concern. That is, with all other things equal, people will visit those recreational areas requiring less travel time in larger numbers than areas demanding more time. Clawson concludes

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[13]Marion Clawson, "Outdoor Recreation Demands and Benefits," Land Economics, Vol. 39, No. 4 (November, 1963), p. 395.

that if the value of time is ignored, the estimated demand curve will be consistently biased to the left of the true demand curve and would result in an underestimate of the actual demand for the given resources.[14]

Milan, drawing heavily from an article by Jacob Minier, incorporates the value of time into the price variable for 4,311 golfers interviewed on 36 rural golf courses in North Carolina. According to Milan:

> The properly defined price that the user of a golf course faces is not p, transportation cost and admission fees, but P = p + c, where c is the opportunity cost for the time spent playing golf.[15]

According to Milan, the introduction of opportunity cost into an analysis of the demand for golfing services creates two special problems. First, if a positive opportunity cost exists, transportation cost and admission fees will underestimate the total price facing the user of a golf course. On the other hand, if the opportunity cost is negative, transportation cost and admission fees overstate the total price. Second, the existence of opportunity cost affects the interpretation of income, which is not independent of opportunity cost. That is, if opportunity cost is a function of income, its omission will bias the estimate of the income coefficient.

To determine the empirical content of the above hypothesis, Milan used a dummy variable procedure to quantify the existence of an opportunity cost for playing golf. A value of zero was given an individual who was

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[14] Ibid.

[15] R. L. Milan and E. C. Pasour, Jr., "Estimating the Demand for an On-Farm Recreational Service," American Journal of Agricultural Economics, Vol. 52, No. 1 (February, 1970), p. 127.

not employed fulltime, or when he played on the weekend or after 4:00 p.m. Opportunity cost for the individual in this case was assumed to be negligible. Conversely, a value of one was assigned the individual when he was employed fulltime and played during the week before 4:00 p.m. In this case, opportunity cost was assumed to exert an appreciable influence. The results of the analysis found that a significant positive opportunity cost existed in the demand for golf.

Several serious questions arise in considering opportunity cost as an integral part of the price variable. First, for opportunity cost to be a "cost" there must be evidence of a willingness to take advantage of the opportunity to gain a higher income. In the present case the fact that an individual plays golf seems to be evidence that the individual does not view the foregone income as a cost. It may be that recreation is like food--a certain amount is needed regardless of, and unrelated to the income level. Further, the relationship with income, in the case of both food and recreation, may depend primarily on the type or quality of goods and services demanded. For example, those with a higher income may eat steak and play golf, whereas those with a lower income may eat hamburger and go to auto races.

Further, according to the opportunity cost concept, as it is related to the demand for golf, the higher an individual's income per hour the less he would demand golf. However, it is observed, at least within a given income range, that the reverse is true. It is primarily the middle and upper income people who play golf.

The extent that an opportunity exists also depends on the value an individual places on additional leisure time. This depends to a

large degree on the occupational structure. Clarke[16] in a study of occupational prestige among 3,010 urban adults found that the proportion of the upper occupational classes, such as professional persons who would use this time to work at their job, is almost as great as the percentage who would relax and rest. On the other hand, people in the lower occupational classes such as service and unskilled workers, indicated they would use the majority of the added leisure time to rest, loaf and relax.

Finally, the very foundation of demand analysis is open to question when opportunity cost is considered as a significant part of the price variable. That is, what does the inclusion of opportunity cost do to the concept of a price schedule? If there is a different price for every buyer, then what?

It is recognized in this study that time is important as a constraint on participation in golf; however, this is little different from time needed to consume ordinary goods and services that are marketed in the economy. Thus, in this analysis opportunity cost was not considered as a significant part of the price variable. Price is defined as the cost of green fees plus transportation costs.

Tastes and Preferences

Tastes and preferences of the consumer play a large role in determining the quantity of a commodity demanded at given prices.

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[16]Alfred C. Clarke, "Leisure and Occupational Prestige," Mass Leisure, Edited by Eric Larrabie and Rolf Meyersohn (Glencoe: The Free Press, 1958), pp. 211-212.

Tastes and preferences are governed by a host of circumstances, such as family composition, cultural tradition, and religion. Although such factors are difficult to measure, they provide an insight into the reasons why the consumer behaves the way he does in the market place. Consumer demand analysis describes such behavior by the use of indifference curves.

The curve in Figure 3 represents an indifference curve. Such curves represent a graphic picture of the consumer's tastes and preferences by showing the different combinations of goods X and Y per unit of time which yield equal satisfaction. The analysis rests upon the assumption that the consumer can tell which of the various combinations yield equal satisfaction and which yield greater or less satisfaction.

Most consumer demand analysis, however, treat tastes and preferences as fixed. This assumption appears to be reasonable since most factors affecting tastes and preferences are rather stable and depend upon such slowly changing items as demographic characteristics and cultural tradition. Moreover, tastes and preferences generally are not appreciably influenced by most of the economic forces the economist studies. Using the above reasons, tastes and preferences were excluded from the analysis.

Socioeconomic Characteristics

The propensity of each individual in the market place to consume is constrained by a combination of social and economic characteristics. Traditional demand analysis gives major emphasis to the income of the

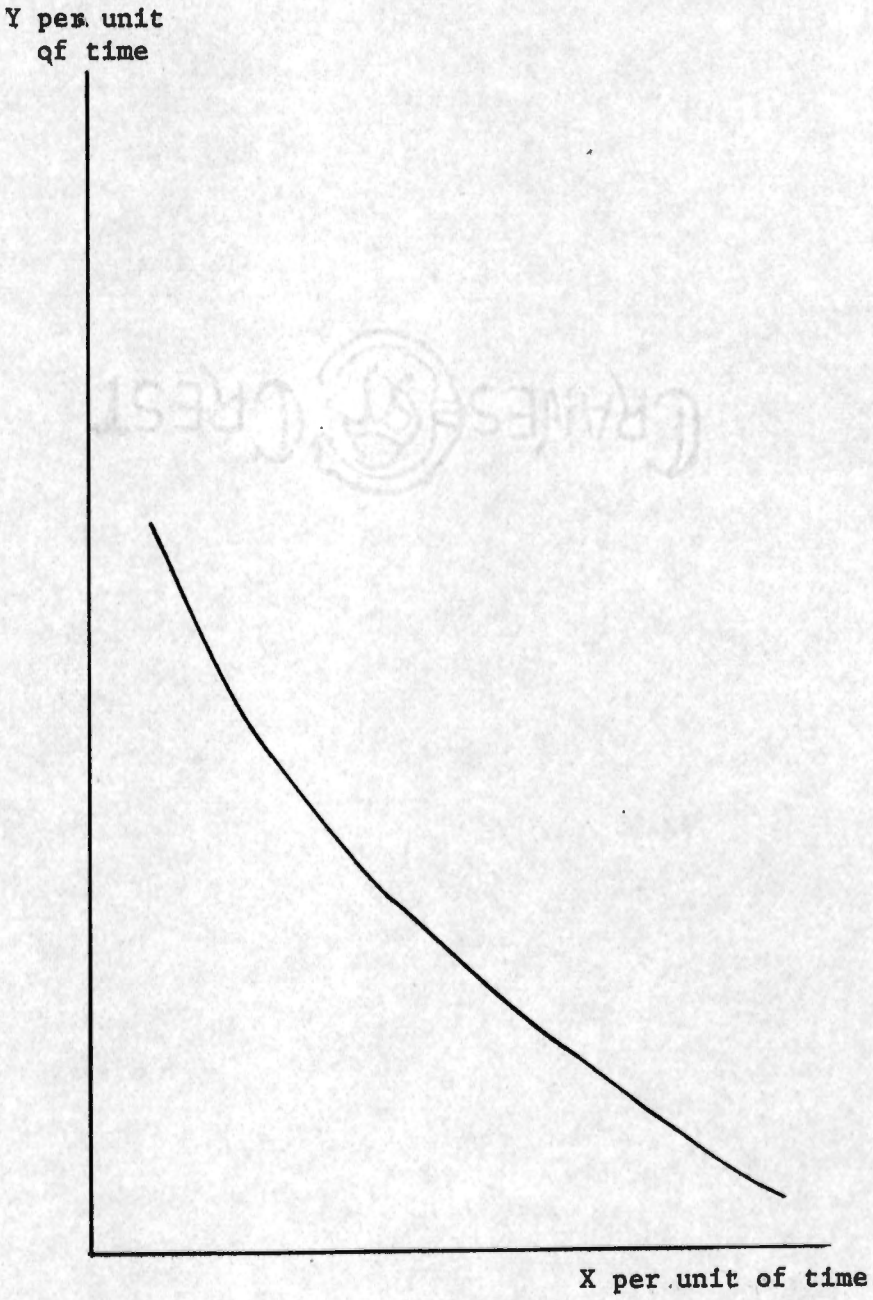


Figure 3. Indifference curve.

individual as the major constraint. However, research in recreation has indicated factors such as occupation, age, education and availability of leisure time play an equally important role in influencing participation. All are closely correlated, but each in its own way exerts a significant constraint on participation. As a result, the socioeconomic variables used in this analysis of participation in golf are discussed separately.

Income. Income provides the means by which the consumer converts his wants and desires into an effective demand. For any given time period, however, the consumer has only a fixed amount of income. For this study, income was defined as annual gross family income.

The use of income may be divided into three categories: that for existence, that for subsistence and that which is discretionary. That is, a minimum level of income is needed merely to sustain life, and additional income is required to hold a job or otherwise do productive work.[17] Discretionary income results from what is left over. Therefore, golfing expenditures must come from discretionary income or that part of income which is available after payments for existence and subsistence.

Golfing expenditures, however, are in direct competition with other goods and commodities for the consumer's discretionary income. According to consumer demand theory, the consumer solves this allocation problem by applying the principle that the marginal utility obtained by

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[17]Marion Clawson and Jack L. Knetsch, Economics of Outdoor Recreation (Baltimore: The Johns Hopkins Press, 1966), p. 102.

spending a dollar on golfing must equal the marginal utility of a dollar's worth of any other good purchased. That is, with a given income, consumer satisfaction will be maximized as follows:

$$\frac{MU_x}{P_x} = \frac{MU_y}{P_y}$$

where:

MU_x = marginal utility of golf

MU_y = marginal utility of ordinary good

P_x = price of golf

P_y = price of ordinary good

Expenditure patterns will vary with increases in income. As income increases from very low levels for certain basic commodities such as food, consumption may increase considerably at first. However, with income continuing to increase, consumption of basic commodities may become less than proportional to income increases.[18] This pattern is shown in Figure 4. Income is measured on the vertical axis while quantities of the food item are measured on the horizontal axis. Assuming the food item is a normal good, as income increases from I_1 to I_2, expenditures will increase from X_1 to X_2. However, as income continues to increase, the consumer will begin to consider products other than those of necessity.

Expenditures on recreation, for example, may increase, up to a certain level, in a greater proportion than income. The ORRRC report

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[18]Richard H. Leftwich, The Price System and Resource Allocation (New York: Holt, Rinehart and Winston, 1965), pp. 85-86.

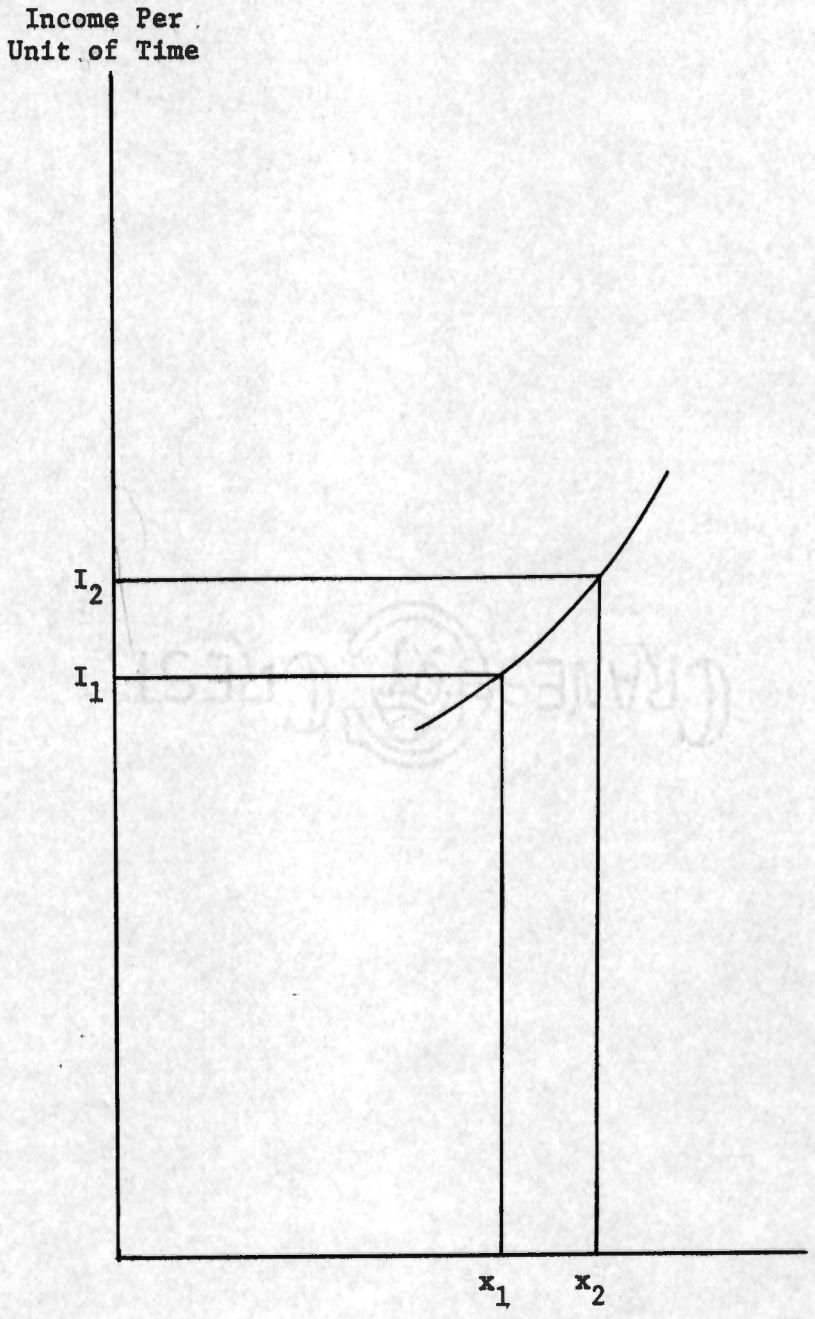


Figure 4. Effect of change in income on expenditures for food.

showed that, in general, participation in recreational activities tended to increase as income increased. The jump was sharpest at about the $3,000 a year mark; from there on participation steadily increased, reaching a maximum in the $7,500-$10,000 bracket, and declining slightly thereafter.[19] It is worthy to note that these values were based on 1960 price and income levels and one would expect them to change as the value of the dollar changed.

This situation with respect to expenditures on golf is shown in Figure 5. Expenditures on golf are measured on the horizontal axis. As income increases, expenditure on golf increases in greater proportion than does income.

As the above discussion implies, golf was assumed to be a normal good in this analysis. Thus, it is hypothesized that an increase in income is expected to have a positive effect on the participation in golf by the individual. That is, as income increases the quantity of golf that an individual plays will increase if other factors known to influence quantity are held constant.

Occupation. The occupation of the consumer has a considerable influence on consumption patterns. Sorokin[20] points out "that in a

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[19]Outdoor Recreation Resources Review Commission, Outdoor Recreation for America (Washington, D.C.: U. S. Government Printing Office, January, 1962), p. 28.

[20]Rabel J. Burdge, "Levels of Occupational Prestige and Leisure Activity," Journal of Leisure Research, Vol. 1, No. 3 (Summer, 1969), p. 262.

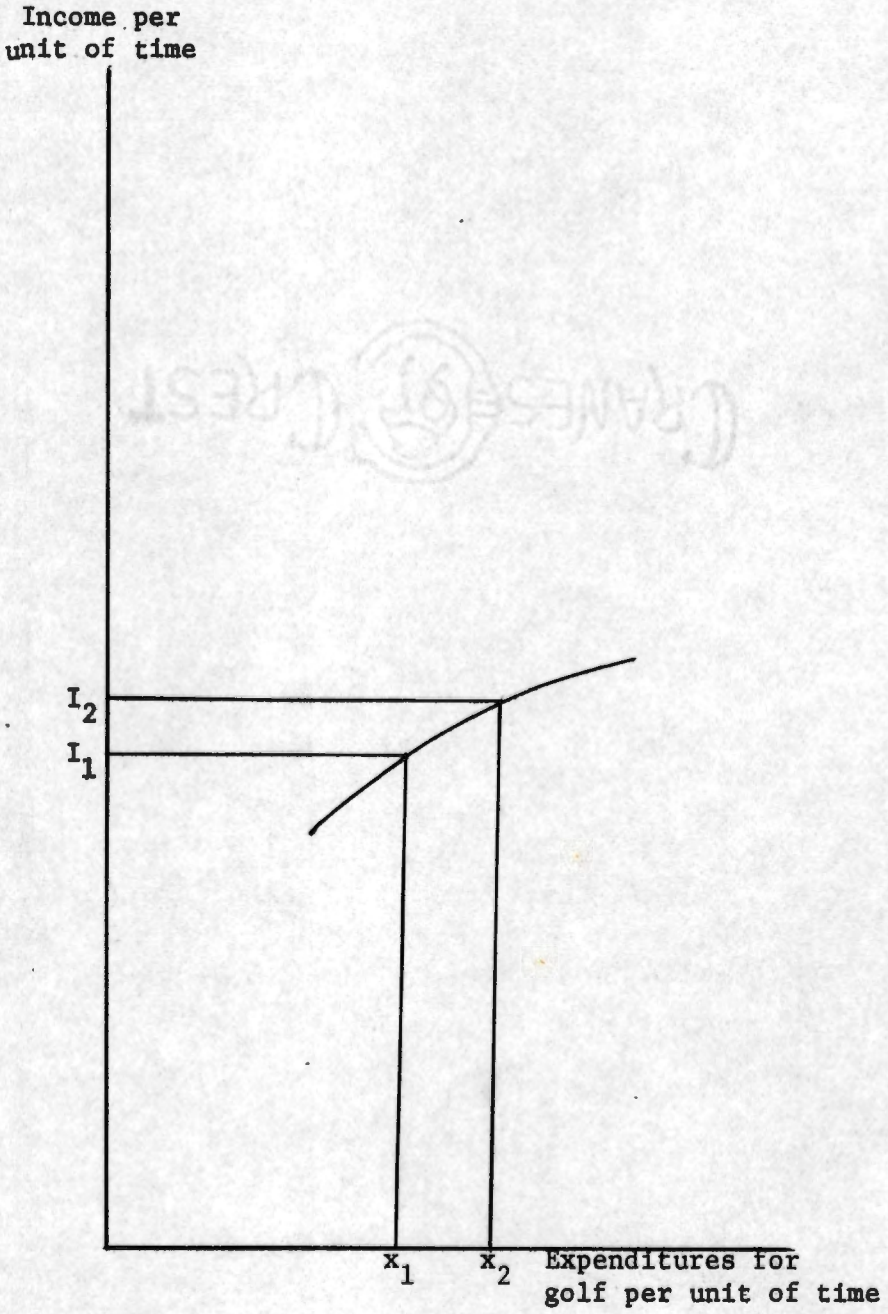


Figure 5. Effect of change in income on expenditures for golf.

society with a complex division of labor, the occupation exerts influence in the form of occupational selection and in molding the body, mind and behavior of its members." On this last position he notes that "the occupation group is one of the most indispensable coordinates for a definition of the sociocultural position in an individual. . . ."

Thus, membership in an occupation provides social recognition in the form of status. In general, society assigns higher status to individuals who are willing to acquire the necessary skill and education for complex occupations. Such social stratification leads to differences in income and buying power. For example, doctors and lawyers generally have higher incomes and thus may eat more steak and belong to exclusive country clubs. On the other hand, engineers and school teachers generally have median incomes and thus may eat more hamburger and play their golf on municipal golf courses.

The Outdoor Recreation Resources Review Commission (ORRRC) reports that occupation is clearly related to outdoor activity.[21] The activity scores reported for 2,750 observations tended to decline down the occupational status hierarchy, from professionals to unskilled workers. Farmers had the lowest outdoor activity score.

Traditionally, golf has been thought of as an outdoor activity played primarily by individuals in the upper occupational hierarchy.

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[21]Outdoor Recreation Resources Review Commission, Participation in Outdoor Recreation: Factors Affecting Demand Among American Adults, ORRRC Study Report 20 (Washington: U. S. Government Printing Office, 1963), p. 11.

Clarke,[22] however, in a study of the leisure behavior of 3,000 urban respondents, suggests evidence to the contrary. By use of the North-Hatt Occupational Prestige Scale, Clarke analyzed the frequency of participation in specific leisure time activities. Most of the relationships between occupation and 26 leisure activities were linear, or near linear in nature. Golf, however, was curvilinear. For example, the number of times a year the respondents played golf increased along with their prestige ratings until the middle status group (included sales, clerical, and white-collar workers) was reached. At this point the frequency of participation began to decline with higher occupation scores. Within this middle group, the highest degree of participation occurred among those who classified themselves as "salesman." This would appear to be consistent with the widespread conception that golf offers an excellent opportunity for pursuing business relations under informal and pleasant surroundings.

Clarke also pointed out that among the participant sports, golf represents perhaps the most pertinent example of how an activity is being transformed from the exclusive pastime of a few wealthy individuals to a popular pastime for many, representing diversified backgrounds in income and social status. However, he suggests that because of the possible instrumental nature of golf, that membership in the "right" golf club could still be accepted as an important index of social status.

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[22] Alfred C. Clarke, "Leisure and Occupational Prestige," Mass Leisure, Edited by Eric Larrabie and Rolf Meyersohn (Glencoe: The Free Press, 1958), pp. 205-213.

To determine the variation in participation in golf among different occupations, this study defined occupations according to the classifications of the Bureau of Census. These were: (1) clerical and service, (2) rancher or farmer, (3) professional, technical, (4) sales, (5) craftsman, foreman, (6) operative, (7) laborer, (8) management, proprietor, (9) retired, (10) student, (11) homemaker and (12) member armed forces and disabled.

Leisure. Leisure is defined as time free from formal work and duties. Like income, it is largely discretionary. That is, it is time left over after necessary obligations have been met. Therefore, since golfing occurs primarily during leisure time, the amount of leisure available for each individual will influence his participation.

To determine the extent of the influence of available leisure time on participation in golf, leisure time was divided into four broad categories. These categories are defined as follows:

(1) Vacation days = number of vacation days were counted only if on a normal working day.

(2) Holidays = number of holidays were counted only if they were on weekdays.

(3) Weekends = number of weekend leisure hours covered from Friday evening, 6:00 p.m. to 10:00 p.m. and Saturday and Sunday from 8:00 a.m. through 10:00 p.m. Therefore, one person can have a maximum of 32 weekend leisure hours.

(4) Weekdays = number of weekday leisure hours covered from 6:00 p.m. to 10:00 p.m. Monday through Friday.

As mentioned previously, time has an economic value. This holds true whether it is leisure or nonleisure time. Closely related to how the consumer chooses between leisure and nonleisure time is the prevailing wage rate. Theoretically, this may be explained within the framework of the backward bending segment of the supply curve of labor (Figure 6).[23] That is, with a rise in the real wage rate arising from an increased demand for labor, the consumer is confronted with two effects: (1) The consumer's leisure is now more expensive, since the cost of an hour of leisure is the wage that could be earned in that hour. This is the substitution effect and by itself would tend to raise the number of hours worked. (2) On the other hand, if the consumer were to work the same number of hours, the rise in the real wage rate increases his real income, which would lead him to want to purchase more of the various kinds of goods, including leisure. This represents the income effect, and by itself would tend to reduce the number of hours worked unless leisure is an inferior good.

The principal argument, therefore, is that beyond some point the income effect dominates the substitution effect. This may result in people working fewer hours and the withdrawal of supplementary workers from the labor force. The final choice, however, relies heavily on the relative value attached to goods purchased with money through the market relative to goods that can be acquired through nonmarket activity.

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[23] Milton Friedman, Price Theory (Chicago: Aldine Publishing Company, 1968), pp. 203-204.

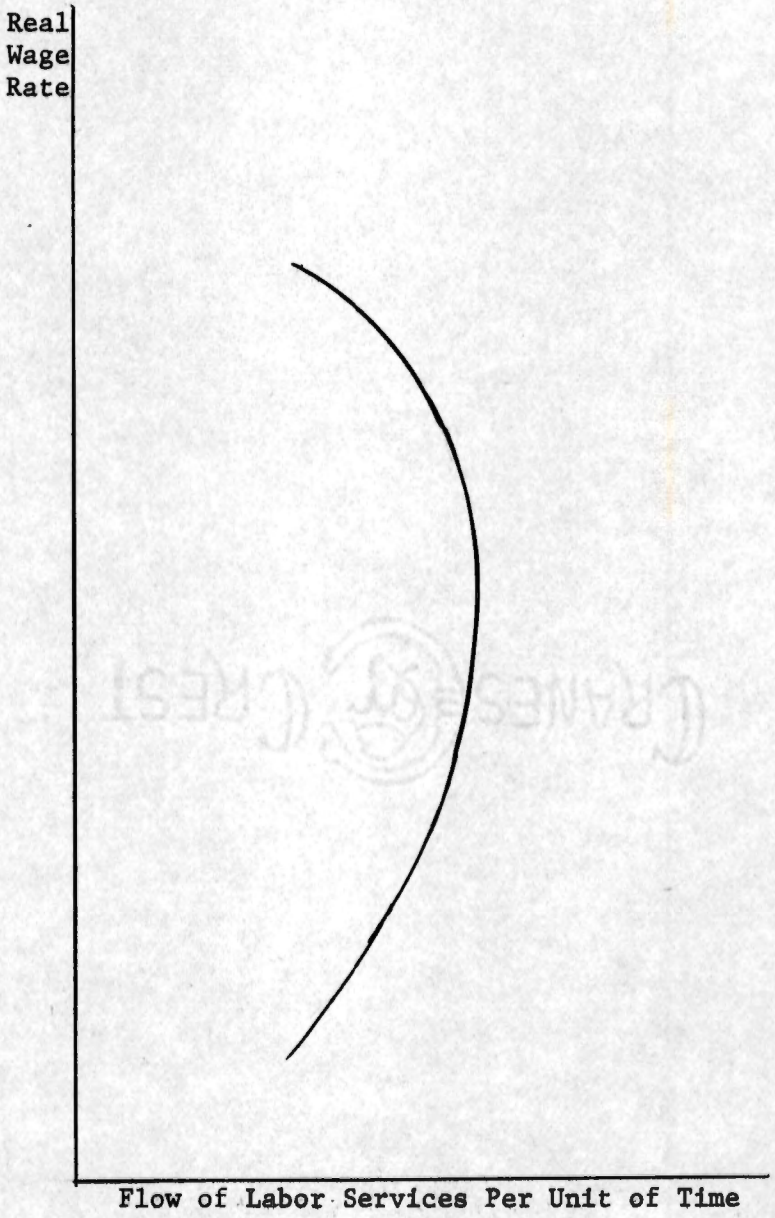


Figure 6. Backward bending supply curve of labor.

Age. The age composition of our society is changing with the expectation of increases in the older and younger age groups. Golf represents a recreational activity that can be played by both age groups. Thus, age represents an important socioeconomic variable when considering variations in the participation rates of golf. The ORRRC reports that of all the factors influencing the demand for recreation, age has the sharpest influence.[24]

Education. Education exhibits a strong positive relationship with outdoor activities. Participation rates are the greatest for those with a higher education.[25] One exception, however, is that college graduates participate less than high school graduates.

Sex. Sex represents an important socioeconomic factor influencing participation in outdoor activities. In general, men engage in outdoor activities more than women. This is particularly true with such recreational activities as hunting and fishing. Golf, however, appeals to both sexes.

Substitutes and Complements

Conventional consumer demand analyzes the effect of related goods or services on the demand for a particular good within the framework of

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[24]Outdoor Recreation Resources Review Commission, Participation in Outdoor Recreation: Factors Affecting Demand Among American Adults, ORRRC Study Report 20 (Washington: U. S. Government Printing Office, 1962), p. 15.

[25]Ibid., p. 11.

substitutes and complements. If a related good is a substitute, an increase in its price will cause the demand curve for the commodity to shift to the right as consumers turn from the relatively higher price substitute to the commodity. If the relationship is complementary, an increase in price will decrease sales and cause a shift to the left in the demand for the commodity.

All golf courses are in varying degrees substitutes for one another; the attendance at one course is conditioned by the existence and characteristics of others. If the different courses are highly similar, then each course is almost completely competitive with each other. On the other hand, if one course has synthetic greens and another does not, then it might be argued that they are independent and one does not substitute for the other.

Thus, it was assumed that the courses sampled were sufficiently similar to be perfect substitutes. In this sense, they are the same good.

Another possible substitute for golf is another type of recreational activity. However, McCoy[26] at Tennessee found that it was difficult to find a close substitute for golf. Still further, Milan[27] in an analysis of golfing services in the North Carolina Piedmont hypothesized that fishing might serve as a substitute for the use of a golf course. Results,

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[26]Edward Wayne McCoy, "Analysis of the Utilization of Outdoor Recreation in Tennessee" (Unpublished Doctor's dissertation, University of Tennessee, Knoxville, 1966), p. 61.

[27]R. L. Milan, "An Analysis of the Demand for Selected Golfing Services in the North Carolina Piedmont" (Unpublished Doctor's dissertation, North Carolina State University, Raleigh, 1968), p. 25.

however, indicated that the cross-elasticity between golf and fishing was zero. Therefore, prices of substitutes were not considered as a significant variable influencing participation in golf in this study.

It is also possible that different courses may be complementary; that is, the increased use of one promotes increased use of the other. However, this was assumed not to be the case for the type courses included in the sample. All of the courses included were located so far apart that influence of one course on the other was assumed negligible. Thus, the price of complements were excluded from the analysis.

II. ECONOMIC MODEL: USER DEMAND FUNCTION

The demand function discussed represents the willingness and ability of the consumer to purchase the golfing product or service. That is, it provides a measure of the response of amount taken to a change in price. However, a great deal of difficulty is encountered in attempting to measure or quantify the price of the total golfing experience. In view of this problem, one must seek a function which expresses the willingness of the consumer to participate in golf subject to the price variables which are measurable along with the nonprice variables. The function hypothesized is the user demand function.

The user demand function provides a measure of the amount of golfing services the consumer actually purchased at a given cost. The principal assumption is that when a person participated in golf, he overcame the obstacles which might have prevented him from doing so--such as lack of time, lack of funds, lack of opportunities, ill health,

and old age. This approach also includes the ability to pay for the golfing experience. It does not assume, however, a willingness to take more or less under different conditions of availability. The user demand function thus is hypothesized to be:

$$Y = B_0 + B_1X_1 + B_2X_2 + \ldots + B_iX_i + \ldots + B_{N-1}X_{N-1} \cdot i = {}^3X, \ldots 18$$

where:

Y = annual number of visits by the individual to the golf course

B_0 = constant term

X_1 = price the individual pays to use the golf course per visit

X_2 = annual income of the individual

X_3 = age of the individual

X_4 = education of the individual

Occupation of the individual:

X_5 = clerical and service

X_6 = rancher or farmer

X_7 = professional, technical

X_8 = sales

X_9 = craftsman, foreman

X_{10} = operative

X_{11} = laborer

X_{12} = management, proprietor

X_{13} = retired

X_{14} = student

X_{15} = homemaker

X_{16} = other

Sex of the individual:

X_{17} = male

X_{18} = female

III. STATISTICAL CONSIDERATIONS

Economic theory provides a framework for establishing relationships that are important to the analysis of a particular economic problem. Theoretical propositions, however, represent generalizations and refer to all possible observations. In order to utilize economic theory, therefore, inferences about such observations must be made in order to provide a basis for empirical conformation. Statistical theory forms the foundation for such inferences by providing a framework for collecting and analyzing the observations. Statistical hypotheses or basic propositions about the unknown observations constitute the basic form of inference. They allow the researcher to abstract from the complexity of the real world and make generalized statements of relations among facts which, in turn, provides a means of extension of knowledge beyond the given theoretical framework. Statistical theory, therefore, not only provides a link between economic theory and observations, but also provides guidelines for extension of scientific knowledge.

Regression Analysis

Traditionally, the central concepts of economic theory are specified as functional relationships among economic variables. Regression analysis represents one of the most common statistical tools used to establish such relationships. The basic problem of regression involves

estimating the expected value of one variable on the basis of observed values of others. Such a regression function shows a stochastic relationship which when given a value of the independent variable X will not provide a unique value of the dependent variable, Y, but the expected (average) value of Y. Thus, in linear regression one assumes and attempts to estimate a theoretical relationship between Y and X of the form;

$$Y = a + bX \qquad (1)$$

where:

Y = dependent variable

a = intercept value

b = regression coefficient

X = independent variable

Such a regression function as equation (1) represents an exact functional relationship between X and Y. In reality, inspection of empirical economic data shows that such exact functional relationships do not hold; that is, all the points are not found lying along a straight line. This does not mean we refute our theory because of the presence of some unknown errors in our analysis. Rather it requires that our theory should be extended to include an unknown random error term (u). Thus, our regression equation now becomes:

$$Y = a + bX + u \qquad (2)$$

The most common statistical tool for handling such errors or estimating (2) is Least Squares Regression. The approach is such that the functional relationship selected for estimation minimizes the sum

of the squares of the vertical deviations of the observations (Y) from the estimating equation $\hat{Y}$. That is:

$$D = (Y_1 - \hat{Y})^2 + (Y_2 - \hat{Y})^2 + (Y_3 - \hat{Y})^2 + \ldots + (Y_{n-1} - \hat{Y})^2 \qquad (3)$$

Empirical application of equation (2) requires one further step. Assumptions involving the probability distribution of u must also be made. These assumptions about u and the statistical tests of their plausibility are the crucial steps in the empirical application of the regression equation. The assumptions are:[28]

1. the variables are measured without error
2. the mean of the errors is zero
3. the distribution of the errors has a constant finite variance
4. the errors are independent of each other; that is, no serial correlation exists among the error terms
5. the errors are normally distributed
6. the values of the independent variables are fixed.

The actual functional form of the empirical regression model (2) is also of major concern. For this study, linear, quadratic and logarithmic functional forms were examined. Using the coefficient of determination (R^2) as a criterion for selection of the functional form that best fits the data, linear and quadratic forms were rejected. Instead, a semi-logarithmic functional form was chosen in which quantity (Y) was converted to logarithms and the remaining variables left in their

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[28]For a discussion of the assumptions of regression analysis, see Edward J. Kane, Economic Statistics (New York: Harper and Row Publishers, 1968), pp. 351-381.

original units. Thus, the functional form chosen for this study was:

$$\ln Y = a + bX + u$$

Stepwise regression. This study utilized the stepwise regression procedure. This statistical model examines a sequence of multiple linear regression equations in a stepwise fashion. Each step involves the addition of a single variable and a corresponding reexamination of variables incorporated into the model in previous steps. The selection of the variable to enter at each stage is determined by the variable which makes the greatest reduction in the error sum of squares. However, to examine the effect of the entering variable upon previously added variables, a partial F criterion for each variable in the equation is evaluated with a preselected percentage point of the appropriate F distribution. This procedure enables the researcher to analyze each variable as though it had been the most recent variable entered, regardless of its actual point of entry into the regression model. In this manner nonsignificant variables are removed from the model. The process continues until no more variables are admitted and no more are rejected.[29]

Dummy Variables

Variables considered in regression equations generally can take values over some continuous range. Such variables are easily quantified. However, some variables often have two or more distinct levels, thus

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[29]N. R. Draper and H. Smith, Applied Regression Analysis (New York: John Wiley and Sons, Inc., 1966), p. 171.

making it difficult to establish a continuous scale for the variable. Generally, such variables are of a qualitative nature and difficult to quantify. Some value must be assigned to the respective levels to take account of the fact that these variables may have separate deterministic effects on the dependent variable. Dummy variables represent one method for handling such variables.

Tomek[30] points out that dummy variables may be used in regression analysis when:

1. The original observations can be divided logically into mutually exclusive classes.
2. The effect of the class difference is to change the Y-intercept level of the regression equation without changing the slope coefficients.

The first prerequisite of "mutually exclusive classes" allows the researcher to consider each class as an independent variable. Numerical values may then be assigned to the respective variables. In general, dummy variables are assigned the value of zero or one. Using this procedure facilitates the economic interpretation of the results of the qualitative independent variables in the regression function. For example, occupation was one of the variables specified to influence the quantity of golf played. This required conversion of the different levels of occupation into numerical values. To do this, golfers were categorized into respective occupations. If a golfer was listed as a

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[30]William G. Tomek, "Using Zero-One Variables with Time Series Data in Regression Equations," Journal of Farm Economics, Vol. 45, No. 4 (November, 1963), pp. 814-822.

dentist, he was classified as a professional; therefore, he could not be classified in any of the remaining classifications. A numerical value of one was thus entered for professional and zeros for the remaining occupational classes.

The second prerequisite listed by Tomek is more difficult to satisfy. The effect of the class differences may not only change the intercept level but also the slope. In this case, the results are extremely difficult to interpret. Thus, in this study it was assumed that the slopes were equal. For example, this condition is depicted graphically in Figure 7.[31] The Y axis represents the annual number of golfing trips and the X axis the level of income. Golfers are divided into two mutually exclusive occupational classes--professionals and laborers--and the resulting relationship between Y and X are shown for observations in each subset. These relationships are depicted by lines AA' and BB' showing golfers classified as professional and laborers, respectively. The two lines have the same slope, but they have different Y intercepts. For any given level of income, golfers classified as professionals participate more in golf than do those classified as laborers. It is observed that at zero level of income, laborers take OB trips while professionals take OA trips.

One variable within each class must be set at zero (deleted) in order to avoid indeterminate results. The deleted variable is then used

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[31] Bernard L. Green and H. A. Wadsworth, Campers: What Affects Participation and What Do They Want? Research Bulletin No. 823 (Lafayette: Purdue University, Agricultural Experiment Station, December, 1966), pp. 15-16.

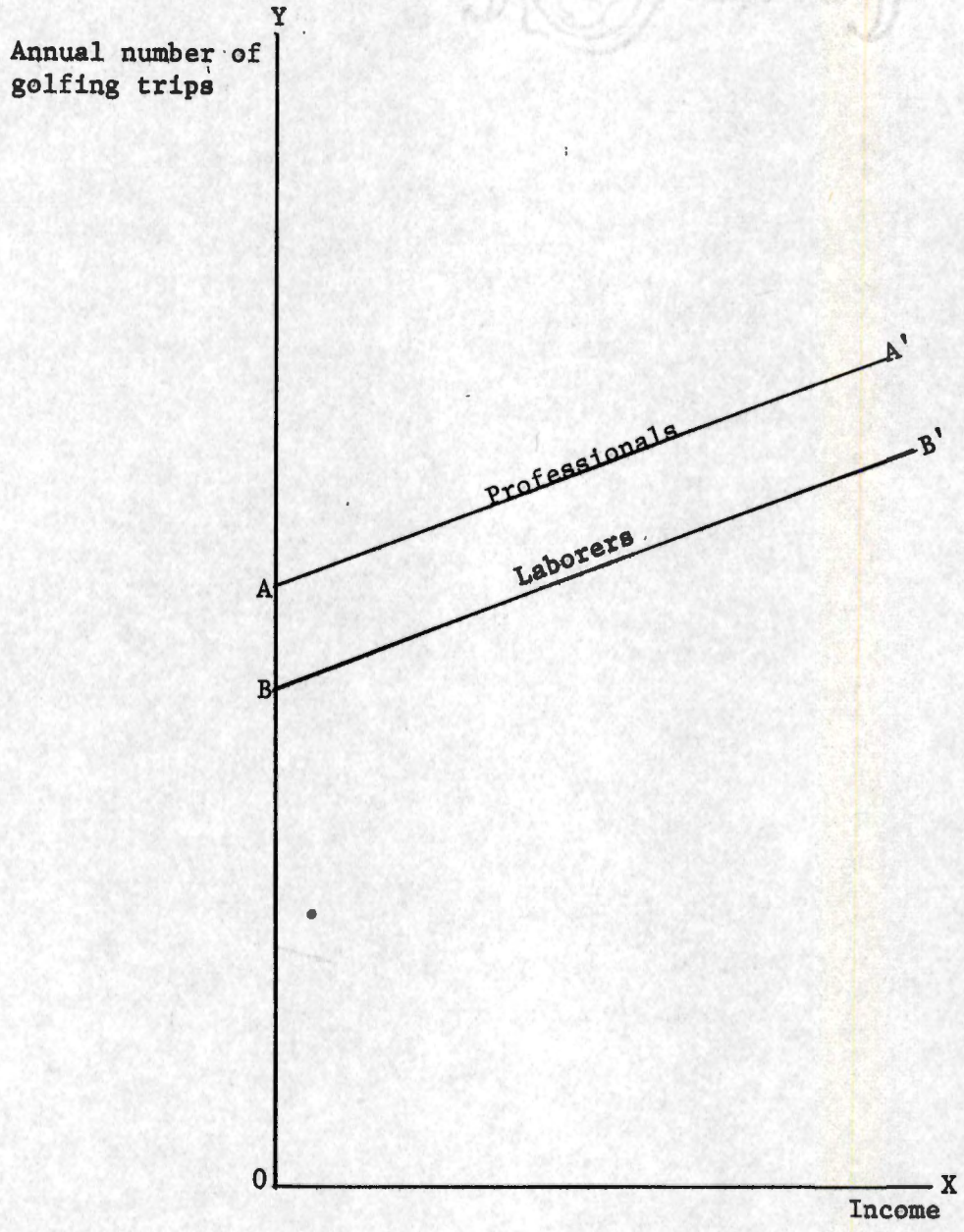


Figure 7. Occupational effect on the intercept level of the regression equation.

as a bench mark from which other variables in the class can be compared. Therefore, the regression coefficients for the remaining dummy variables are measures of vertical distances above or below the regression for the deleted class. Tests of statistical significance may then be applied to determine whether the vertical distances are due to chance.

Elasticity

Elasticity is defined as the percentage change in quantity associated with a 1 percent change in a causal variable, ceteris paribus. If the causal variable is price, the elasticity is called price elasticity and measures the responsiveness of the quantity of a product which consumers are willing to take to changes in the price of the product. If the causal variable is income, the elasticity is called income elasticity and measures the percentage change in the quantity demanded in response to a percentage change in income, prices remaining constant.

Point elasticity was used for purposes of analysis in this study. It provided a measure of the percentage change in quantity at the mean of prices and incomes, respectively. Thus, point elasticity was defined mathematically as:

$$Ex = \frac{dy}{dx} \cdot \frac{x}{y}$$

$$\frac{dy}{dx} = b_1 y$$

$$Ex = b_1 x$$

where:

Ex = price or income elasticity

y = quantity

x = level of price or income

CHAPTER III

COSTS AND RETURNS

Planning is necessary to make sound management decisions for developing and operating golf courses. Increases in population, structural changes in the rural-urban environment, increasing recreational demands and economic pressures from other segments of the economy magnify the importance of planning. Results from the analysis of 1968 costs and returns data associated with 13 urban and 10 rural golf courses that are presented in this chapter should help to systematically evaluate the complex alternatives confronting golf course managers.

I. VARIABLE AND FIXED COSTS

Variable Costs

Variable costs represent direct "out of pocket" cash costs that are present as long as the golf course is in operation. Such costs are related closely to the volume of business and must be met or the golf course will eventually have to discontinue its operation. In general, variable costs are flexible since such costs represent current expenditures for operating the golf course. The major variable costs result from expenditures for golf course maintenance, golf supplies and food items.

Maintenance costs. The major maintenance cost item is labor. This includes the cost of labor used for the operation of the clubhouse

and for general maintenance of the golf course. The second major maintenance cost item is for materials and supplies. These cost items include fertilizer and fungicides, gasoline and oil, hay for coverage of greens in winter and general repairs. Such costs are extremely variable and depend to a large extent upon topography, climate and managerial practices.

A third major cost item is the repair cost associated with various items of equipment. A golf course requires a large amount of equipment and machinery, and because of heavy usage annual repairs are quite large. For this study annual repairs were computed on the basis of a percentage of the initial purchase price of equipment item. The percentages used were based on information obtained from consultations with greens superintendents and equipment manufacturers. Annual repair costs for selected equipment items are indicated in Appendix C.

Utilities represent the fourth major item of maintenance costs. Electricity, water and telephone costs represent the major utility costs and are incurred primarily in the operation of the clubhouse.

Golf supplies and food costs. Golf supplies and food sold in the clubhouse represent the second major category of variable costs. Golf supplies included golfing equipment and wearing apparel and were sold at all of the golf courses. Food supplies included the cost of food and beverages sold in that part of the clubhouse connected directly with the golfing operation.

Fixed Costs

Fixed costs represent those costs which must be paid whether the

golf course is in operation or not. Payment of such costs may be delayed but must be met in the long run if the course is to continue to operate.

Depreciation. Depreciation represents one of the largest fixed cost items and measures the value an item decreases over a given time period. The straight line method for computing annual depreciation was used. Salvage value was subtracted from the initial cost of the equipment item and divided by the item's years of useful life.

Annual depreciation costs for equipment items used in the operation of the golf courses were computed. The purchase price of the equipment items was based on information obtained by personal interviews. Where this information was not available, the prices shown in Appendix D that were obtained from equipment manufacturers were used for calculating depreciation. Salvage value and the years of useful life of the equipment items were based on consultations with greens superintendents and from data received from equipment manufacturers.

Interest. Interest charges represented actual interest payments by management on unpaid investment loans for 1969. Consequently, golf courses that were debt free had no interest cost charged to them in calculating total fixed costs. Thus, courses that had small indebtedness paid relatively small interest charges during the period under consideration.

Other. Other fixed costs include the cost of insurance on buildings and equipment, the cost of the retailer's license and taxes. These cost

figures were obtained by personal interviews with officials of both urban and rural courses.

II. URBAN GOLF COURSES

Characteristics

Physical. Table III shows the physical characteristics of the 13 urban golf courses. The number of years the courses have been in operation ranged from 4 to 46 years for the 18 hole courses and from 15 to 59 years for the nine hole courses. For the 18 hole courses, par averaged 71 and total yardage averaged 6,191 yards. Average participant capacity per day was 580 persons and the average number of participants per course in 1968 was 55,468. For the nine hole courses, par averaged 34 and total yardage averaged 2,643 yards. Average participant capacity per day was 337 persons and the average number of participants per course in 1968 was 38,568.

Financial. All 13 golf courses were municipally operated. Twelve of the 13 courses were financed and owned by the respective municipalities; and one was financed and owned by the State. The most common method of financing the municipally owned courses was by general obligation bonds. The municipality's credit and taxing power formed the basis for the issuance of such bonds. In general, these issues were subject to the approval of the general public, metropolitan council and mayor. Five of the 13 golf courses reported an average annual interest rate of 2.3 percent and the length of the repayment period was 30 years. For

TABLE III

PHYSICAL CHARACTERISTICS OF 13 URBAN GOLF COURSES, TENNESSEE, 1969

Golf Course Number	Years of Operation	Par	Total Yardage	General Terrain	Golf Course Acreage	Total Acreage	Capacity per Day	Total Patronage 1968
				18 Hole				
1	17	70	6,315	Flat	180	373	600	78,000
2	46	71	5,982	Flat	104	104	600	85,000
3	28	70	5,785	Flat	170	170	475	45,000
4	6	72	6,030	Hilly	140	140	400	27,698
5	11	71	6,300	Hilly	103	103	600	16,000
6	27	70	6,560	Flat	200	207	700	75,000
7	45	72	5,980	Hilly	150	150	700	57,573
8	4	72	6,880	Hilly	175	175	800	79,946
9	39	70	5,889	Hilly	83	90	350	35,000
Total	223	638	55,721		1,305	1,512	5,225	499,217
Average	25	71	6,191		145	168	580	55,468
				9 Hole				
10	59	34	2,222	Flat	60	342	300	45,934
11	56	34	2,682	Flat	80	345	325	41,584
12	15	36	3,445	Hilly	75	109	350	26,173
13	32	34	2,225	Flat	60	80	350	40,580
Total	162	138	10,574		275	876	1,325	154,271
Average	40	34	2,643		69	219	331	38,568

the other eight courses, detailed information on the bond issues could not be obtained.

Managerial. Management of the 13 municipal courses was characterized by a distinct dichotomy with respect to decision making. Major decisions concerning the overall development, capital investment and green fees were generally made by the staff of the City's Park and Recreation Board. Daily operations of the course, however, were directed by the club professional and the greens superintendent.

The primary function of the club professional was that of operating the clubhouse. This included selling green fee tickets, providing manpower for the operation of the clubhouse and keeping reports. Six of the 13 professionals received a minimum base salary from the Park and Recreation Board for performing these duties. All the professionals received income from the sale of rental equipment, food and beverages and merchandise in the pro shop. A percentage of the income received from these sources, however, went to the City Park and Recreation Board. The percentage agreement between the club professional and Park and Recreation Board varied for all the municipalities studied.

The primary job of the greens superintendent was to take care of the physical operation of the course. Specific tasks included mowing, fertilizing and general maintenance of tees, greens and fairways. The greens superintendent was also in charge of permanent and seasonal labor working on maintaining the course. For performing these duties a base salary was paid to all 13 greens superintendents.

Capital Investments

Land. All 13 urban golf courses were located within the city limits and within a range of 2 to 10 miles from the central core of the city. Major highway arteries made the courses readily accessible.

Due to location, land costs were extremely high. Estimates of land value provided by municipal officials indicated that present total market value for the nine 18 hole golf courses was almost $12 million, or an average of $1,325,666 per course (Table IV). The present total market value of land for the four nine hole golf courses was over $3 million, or an average of $901,250 per course. Average number of acres for the 18 and nine hole courses was 145 and 69, respectively.

Construction costs. The cost of developing and constructing a golf course varies widely and is difficult to assess. In general, four factors determine the wide range in costs:[1] (1) the cost of land; (2) the natural assets and liabilities of the land chosen; (3) the labor and equipment costs in the area; and (4) the type of design. Thus, construction costs for golf courses vary greatly and to give a cost figure for constructing a nine or 18 hole golf course could be misleading. For example, on relatively flat land, it might be possible for a group of developers to develop a golf course essentially in terms of the actual cost of land and materials such as seed, fertilizer, water pipes and pump sprinklers. On more mountainous areas, however, tremendous increases in costs might be incurred in the removal of trees, rocks and

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[1]National Golf Foundation, Organizing and Operating Public Golf Courses (Chicago: National Golf Foundation, 1967), p. 15.

TABLE IV

NUMBER OF ACRES, ESTIMATED INITIAL COST AND PRESENT MARKET VALUE OF LAND USED, 13 URBAN GOLF COURSES, TENNESSEE, 1969

Golf Course Number	Number of Acres Per Golf Course	Dollars				
		Initial Cost of Golf Course		Present Market Value of Golf Course		Present Market Value of Adjacent Land Per Acre
		Per Acre	Total	Per Acre	Total	
		18 Hole				
1	180	4,000	720,000	15,000	2,700,000	15,000
2	104	1,000	104,000	17,500	1,820,000	17,500
3	170	2,500	425,000	12,000	2,040,000	12,000
4	140	1,000	140,000	10,000	1,400,000	10,000
5	103	500	51,500	7,000	721,000	7,000
6	200	521	104,200	4,500	900,000	5,500
7	150	350	52,500	6,000	900,000	10,000
8	175	471	82,425	4,000	700,000	5,000
9	83	904	75,032	9,036	749,988	9,036
Total	1,305	11,246	1,754,657	85,036	11,930,988	91,036
Average	145	1,250	194,962	9,448	1,325,665	10,115
		9 Hole				
10	60	4,000	240,000	15,000	900,000	15,000
11	80	5,000	400,000	25,000	2,000,000	25,000
12	75	315	23,625	3,000	225,000	4,000
13	60	350	21,000	8,000	480,000	10,000
Total	275	9,665	684,625	51,000	3,605,000	54,000
Average	69	2,416	171,156	12,750	901,250	13,500

for extensive grading. It should be pointed out, however, that site selection depends on many other factors, such as land costs due to the proximity of population centers. Thus, available alternatives may be limited and high construction costs may occur regardless of the physical characteristics of the site.

Another factor which might cause construction costs to vary considerably is the cost of labor. A course located in one area might require paying the men who work on constructing the course only when they work; whereas in another area, the labor may be priced at a higher rate per hour and with time and a half for overtime work. The same relative variations may apply to rental equipment in different areas.

Construction costs for the 13 urban golf courses were difficult to assess because of the above factors and because the courses were constructed from 4 to 59 years ago. Prices for the necessary construction items have changed dramatically through this time period. Estimates of the present cost of replacing such items, however, were obtained from the most knowledgeable sources available. Caution should therefore be observed in using any cost estimates to project construction costs for a given golf course.

Table V shows the estimated total construction cost per course for the nine and 18 hole urban golf courses. For the four nine hole courses the total cost of construction averaged $112,319 per course. Golf course construction accounted for 59 percent of total construction cost and averaged $65,675. Thus, the average cost of construction per golf hole, from tee to green, was $7,297. The construction cost of

TABLE V

ESTIMATED TOTAL CONSTRUCTION COSTS PER COURSE,
13 URBAN GOLF COURSES, TENNESSEE, 1969

Item	Estimated Total Cost			
	9 Hole		18 Hole	
	Dollars	Percent of Total	Dollars	Percent of Total
Buildings and Ancillary Facilities				
Clubhouse	37,250	33	69,556	28
Storage Shed	5,925	5	10,944	4
Parking Lot	2,750	2	10,200	4
Course Shelters	719	1	961	1
Subtotal	46,644	41	91,661	37
Golf Course				
Putting Greens	31,375	28	75,400	30
Tees	4,275	4	15,500	6
Fairways	28,125	25	62,000	25
Hazards	1,900	2	5,044	2
Subtotal	65,675	59	157,944	63
Total	112,319	100	249,605	100

buildings and ancillary facilities accounted for 41 percent of total construction cost and averaged $46,644.

For the nine 18 hole courses the estimated total cost of construction of the course and ancillary facilities averaged $249,605 per course. The average construction cost per golf course was $157,944, or 63 percent of total construction cost. Thus, the average cost of construction per golf hole was $8,775. Construction costs of buildings and ancillary facilities for the 18 hole courses averaged $91,661, or 37 percent of total construction costs.

(a) Buildings and ancillary facilities. Each of the 13 urban golf courses contained a variety of buildings and ancillary facilities. Clubhouses represented the largest structures and served as the focal point for all golfing activity. The clubhouses contained the pro shops, snack bars, lounges, rest rooms and lockers.

The estimated construction cost of clubhouses for the nine 18 hole golf courses averaged $69,556, or 28 percent of total construction cost (Table V, page 60). However, the range in construction costs for the clubhouses was from $30,000 to $143,000 (Table VI). Average size of the clubhouses was 4,712 square feet, and thus, the average cost per square foot was $14.76.

Storage sheds on these nine courses were used to store machinery, fertilizer and rental equipment, and as repair shops. Average construction costs for these facilities was $10,944, or 4 percent of total construction costs. The range in construction costs for storage sheds was from $2,000 to $23,000.

TABLE VI

ESTIMATED SIZE, CONSTRUCTION COST AND ANNUAL DEPRECIATION OF BUILDINGS AND ANCILLARY FACILITIES, NINE 18 HOLE URBAN GOLF COURSES, TENNESSEE, 1969

Golf Course Number	Type	Estimated Size (Sq. Ft.)	Construction Cost (Dollars)	Estimated Life (Years)	Annual Depreciation (Dollars)
Clubhouse					
1	Brick	3,000	60,000	40	1,500
2	Stone	6,500	85,000	40	2,125
3	Brick	5,500	75,000	40	1,875
4	Brick	3,000	40,000	40	1,000
5	Brick	2,500	30,000	40	750
6	Brick	3,400	65,000	40	1,625
7	Brick	3,785	49,000	40	1,225
8	Stone	10,770	143,000	40	4,575
9	Stone	3,950	79,000	40	1,975
Subtotal		42,405	626,000	360	16,650
Average		4,712	69,556	40	1,850
Storage Shed					
1	Frame	1,200	3,000	25	120
2	Frame	800	2,000	25	80
3	Frame	800	2,000	25	80
4	Brick	3,000	20,000	40	500
5	Metal	2,500	10,000	30	333
6	Brick	4,000	11,000	40	275
7	Stone	4,000	12,500	40	312
8	Metal	4,000	23,000	40	575
9	Brick	3,000	15,000	40	375
Subtotal		23,300	98,500	305	2,650
Average		2,589	10,944	34	294

TABLE VI (continued)

Golf Course Number	Type	Estimated Size (Sq. Ft.)	Construction Cost (Dollars)	Estimated Life (Years)	Annual Depreciation (Dollars)
Parking Lot					
1	Paved	45,000	20,000	40	500
2	Paved	45,000	20,000	40	500
3	Paved	90,000	10,000	40	250
4	Paved	60,000	5,000	40	125
5	Paved	45,000	5,000	40	125
6	Paved	39,000	10,000	40	250
7	Paved	24,000	7,000	40	175
8	Paved	36,000	10,000	40	240
9	Gravel	18,000	4,800	40	240
Subtotal		402,000	91,800	360	2,405
Average		44,667	10,200	40	267
Course Shelters					
1	Metal	80	1,500	15	100
2	Wood	100	450	5	90
3	Wood	60	300	5	60
4	Wood	60	600	5	120
5	Metal	90	1,000	15	67
6	Wood	60	400	5	80
7	Wood	100	900	5	180
8	Metal	60	2,000	15	133
9	Brick	100	1,500	15	100
Subtotal		710	8,650	85	930
Average		79	961	9	103
TOTAL			824,950		22,635
AVERAGE			91,661		2,515

Parking lots for these nine courses were generally constructed of asphalt paving. Their average construction cost was $10,200 which represented a cost of $.23 per square foot, or 4 percent of total construction costs.

Course shelters were constructed on all nine courses. Most of these were constructed of wood or metal. Construction costs ranged from $300 to $2,000. Average construction cost was $961, or 1 percent of total construction costs.

Clubhouses for the four nine hole urban golf courses were much smaller than those for the 18 hole courses (Table VII). Three of the clubhouses for the nine hole courses were constructed of brick and one of wood. Average construction cost was $37,250 per clubhouse, which represented 33 percent of the total construction cost for the four courses.

(b) Golf course. One of the most difficult and costly construction items on a golf course is the putting green. Cost of putting greens varies widely because of the large number of interrelated factors such as type, design, soils and topography. As shown in Table VIII, estimated cost per green for the nine 18 hole golf courses ranged from $2,000 to $7,000. The average cost per green was $4,189, or $.81 per square foot. The average construction cost of putting greens for the 18-hole courses was thus $75,400.[2]

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[2]Ten of the 13 golf courses had temporary greens which were used periodically during heavy play, bad weather and during repair work on the permanent greens. In general, they were constructed on a much smaller scale and with cheaper material. In some cases, they were part of the fairway. For those reporting temporary greens, the average construction cost ranged from $150 to $2,000.

TABLE VII

ESTIMATED SIZE, CONSTRUCTION COST AND ANNUAL DEPRECIATION OF BUILDINGS AND ANCILLARY FACILITIES, FOUR 9 HOLE URBAN GOLF COURSES, TENNESSEE, 1969

Golf Course Number	Type	Estimated Size (Sq. Ft.)	Construction Cost (Dollars)	Estimated Life (Years)	Annual Depreciation (Dollars)
Clubhouse					
10	Brick	2,500	50,000	40	1,250
11	Wood	1,500	15,000	20	750
12	Brick	2,500	50,000	40	1,250
13	Brick	2,130	34,000	40	850
Subtotal		8,630	149,000	140	4,100
Average		2,157	37,250	35	1,025
Storage Shed					
10	Frame	800	1,200	15	80
11	Frame	1,500	5,000	20	250
12	Frame	1,000	10,000	20	500
13	Metal	3,000	7,500	40	187
Subtotal		6,300	23,700	95	1,017
Average		1,575	5,925	24	254
Parking Lot					
10	Paved	15,000	3,000	40	75
11	Gravel	22,000	1,500	20	75
12	Paved	15,000	3,000	40	75
13	Paved	22,500	3,500	40	47
Subtotal		74,500	11,000	140	272
Average		18,625	2,750	35	68

TABLE VII (continued)

Golf Course Number	Type	Estimated Size (Sq. Ft.)	Construction Cost (Dollars)	Estimated Life (Years)	Annual Depreciation (Dollars)
Course Shelters					
10	Wood	60	75	5	15
11	Metal	75	1,500	15	100
12	Wood	60	100	5	25
13	Metal	100	1,200	15	80
Subtotal		295	2,875	40	220
Average		74	719	10	55
TOTAL			186,575		5,609
AVERAGE			46,644		1,402

TABLE VIII

ESTIMATED SIZE AND CONSTRUCTION COSTS OF PUTTING GREENS, 13 URBAN GOLF COURSES, TENNESSEE, 1969

Golf Course Number	Type	Number (Unit)	Average Size Per Green (Sq. Ft.)	Average Cost Per Green (Dollars)	Total Cost Per Course (Dollars)
		18 Hole			
1	328 Bermuda	18	5,000	5,000	90,000
2	328 Bermuda	18	6,000	7,000	126,000
3	328 Bermuda	18	4,000	2,000	36,000
4	328 Bermuda	18	4,500	3,500	63,000
5	328 Bermuda	18	4,200	4,000	72,000
6	328 Bermuda	18	6,000	4,000	72,000
7	328 Bermuda	18	5,000	4,500	81,000
8	328 Bermuda	18	7,500	4,500	81,000
9	Pennacross Bent	18	4,500	3,200	57,600
Total		162	46,700	37,700	678,600
Average		18	5,189	4,189	75,400
		9 Hole			
10	328 Bermuda	9	3,500	3,000	27,000
11	328 Bermuda	9	3,200	2,500	22,000
12	328 Bermuda	9	6,000	5,000	45,000
13	328 Bermuda	9	4,000	3,500	31,500
Total		36	16,700	14,000	125,500
Average		9	4,175	3,500	31,375

For the four nine hole urban golf courses, the average size of the putting greens was considerably smaller than they were for the 18 hole courses. The cost per square foot, $.84, was about the same. The cost per green was $3,500 and thus the cost of the putting greens on the nine hole courses averaged $31,375 per course.

All golf courses had one tee per hole.[3] A golfing tee represents the starting point for each hole and, like the putting greens, construction costs vary widely. Such costs depend primarily on the type and size of the tee constructed. For the 13 urban courses most tees were elevated and rectangular in design. Average size of the tees for the 18 hole courses was 2,767 square feet and the most common variety of grass found on the tees was common bermuda (Table IX). The average construction cost per tee was $861, or $.31 per square foot. Total construction cost for the 18 tees on the nine urban courses averaged $15,500.

For the four nine hole courses total construction costs for the nine tees averaged $4,275. The cost per square foot of tees for these courses was $.42.

Fairways for a golf course represent the hitting areas and for the sample courses ranged from 130 to 600 yards in length and 40 to 90 yards in width from tee to green. Consequently, extensive land areas

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[3] In some cases, depending on the design of the golf course, one tee can be utilized for two different golfing holes. Further, all courses sampled had temporary tees which were used periodically during heavy play, bad weather and during repair work on the permanent tees. In general, most of these tees were located on small dirt mounds or cut out of the fairway and as such construction costs were negligible.

TABLE IX

ESTIMATED SIZE AND CONSTRUCTION COST OF TEES,
13 URBAN GOLF COURSES, TENNESSEE, 1969

Golf Course Number	Type	Number (Unit)	Average Size Per Tee (Sq. Ft.)	Average Cost Per Tee (Dollars)	Total Cost Per Course (Dollars)
		18 Hole			
1	Common Bermuda	18	3,500	1,000	18,000
2	Common Bermuda	18	4,000	1,500	27,000
3	Common Bermuda	18	2,000	500	9,000
4	Common Bermuda	18	2,500	750	13,500
5	Common Bermuda	18	1,500	500	9,000
6	Common Bermuda	18	2,400	500	9,000
7	Common Bermuda	18	2,000	500	9,000
8	Common Bermuda	18	4,000	1,000	18,000
9	Common Bermuda	18	3,000	1,500	27,000
Total		162	24,900	7,750	139,500
Average		18	2,767	861	15,500
		9 Hole			
10	Common Bermuda	9	1,500	300	2,700
11	Common Bermuda	9	1,000	500	4,500
12	Common Bermuda	9	1,000	600	5,400
13	Common Bermuda	9	1,000	500	4,500
Total		36	4,500	1,900	17,100
Average		9	1,125	475	4,275

are generally needed and construction costs may be extremely high. The extent of such costs depend heavily on site selection.

Most of the courses sampled required extensive grading because of terrain and heavily wooded areas. Average cost of construction per fairway was $3,444 for the 18 hole courses and $3,125 for the nine hole courses. Total construction cost of fairways for the 18 hole courses averaged $62,000 and for the nine hole courses, $28,125 (Table X).

All the courses had hazards on most every hole. In general, hazards take the form of raised mounds, sand-filled depressions and occasionally grassy hollows. Most of the hazards, however, were natural and consisted of patches of woodland, ponds or gullies.

Sand traps were the most common man-made hazard. There was an average of only 14 traps for the nine 18 hole courses. This may be explained by the fact that, in general, sand traps tend to slow play and their upkeep is quite expensive. Generally they were located adjacent to the putting greens. Average cost of construction was $350 per trap, or $.34 per square foot. Total cost of construction of sand traps for the 18 hole courses averaged $5,044 per course.

A properly constructed irrigation system represents one of the most important and costly items in the construction of a golf course. All 13 urban courses studied had an irrigation system for watering greens and tees. Only one had an irrigation system for fairways. The source of the water supply for 12 of these 13 courses was the city water system. The other course had its water piped from a nearby creek. The cost of

TABLE X

ESTIMATED SIZE AND CONSTRUCTION COSTS OF FAIRWAYS AND HAZARDS,
13 URBAN GOLF COURSES, TENNESSEE, 1969

Golf Course Number	Fairways					Hazards[a]				
	Type	Number (Unit)	Average Width Per Course (Yards)	Average Cost Per Course (Dollars)	Total Cost Per Course (Dollars)	Type	Number (Unit)	Average Size Per Course (Sq. Ft.)	Average Cost Per Course (Dollars)	Total Cost Per Course (Dollars)
					18 Hole					
1	Bermuda	18	75	4,000	72,000	Sand	8	1,000	300	2,400
2	Bermuda	18	90	4,000	72,000	Sand	3	2,000	500	1,500
3	Bermuda	18	75	1,500	27,000	Sand	7	750	200	1,400
4	Bermuda	18	60	2,000	36,000	Sand	17	500	200	3,400
5	Bermuda	18	75	3,500	63,000	Sand	18	500	500	9,000
6	Bermuda	18	50	2,000	36,000	Sand	30	450	200	6,000
7	Bermuda	18	40	5,000	90,000	Sand	3	1,000	400	1,200
8	Bermuda	18	50	6,000	108,000	Sand	41	2,000	500	20,500
9	Bermuda	18	75	3,000	54,000	--	--	--	--	--
Total		162	590	31,000	558,000		127	8,200	2,800	45,400
Average		18	66	3,444	62,000		14	1,025	350	5,044
					9 Hole					
10	Bermuda	9	40	1,500	13,500	--	--	--	--	--
11	Bermuda	9	75	3,000	27,000	Sand	2	500	400	800

TABLE X (continued)

Golf Course Number	Fairways					Hazards[a]				
	Type	Number (Unit)	Average Width Per Course (Yards)	Average Cost Per Course (Dollars)	Total Cost Per Course (Dollars)	Type	Number (Unit)	Average Size Per Course (Sq. Ft.)	Average Cost Per Course (Dollars)	Total Cost Per Course (Dollars)
12	Bermuda	9	40	3,000	27,000	Sand	10	375	300	3,000
13	Bermuda	9	35	5,000	45,000	--	--	--	--	--
Total		36	190	12,500	112,500		12	875	700	3,800
Average		9	47	3,125	28,125		6	437	350	1,900

[a]Only one course had water hazards and the cost of construction was negligible due to natural attributes.

construction of the irrigation system was included in the cost estimates determined for the greens, tees and fairways.[4]

Equipment costs. The cost of equipment items used on a golf course varies considerably. The total cost depends on the type and size of course and the standards of maintenance that are desired. Most courses require five different categories of equipment: (1) tractors and trucks, (2) mowing, (3) maintenance, (4) rental, and (5) standard equipment. Selected equipment items for each of these categories and their related costs are shown in Appendix C.

For the nine 18 hole golf courses, equipment cost averaged $49,742 per course (Table XI). The major portion of this cost, 54 percent, represented the cost of rental equipment. Power carts were the major rental equipment items. Twenty-two power carts were rented per course and the average cost per cart was $1,188. Total cost of power carts for the nine courses was $25,898 per course. Annual depreciation cost on equipment items averaged $7,050 per course.

The cost of green and fairway mowers represented 83 percent of the total cost of mowing equipment. Each course had an average of six green mowers and the average cost per mower was $423. Each course had a variety of other rotary type mowers costing an average of $238 each.

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[4]Greens superintendents and/or golf course managers of the 13 urban golf courses were asked to estimate a specific cost of developing an irrigation system. The average estimate of the cost of construction and materials for the projected irrigation system was $17,111 for the 18 hole courses and $8,030 for the nine hole courses.

TABLE XI

ESTIMATED COSTS PER UNIT OF EQUIPMENT, TOTAL COSTS AND ANNUAL DEPRECIATION FOR MAJOR ITEMS OF EQUIPMENT USED IN THE OPERATION OF NINE 18 HOLE URBAN GOLF COURSES, TENNESSEE, 1969

Item	Average Number Per Course (Unit)	Cost Per Unit (Dollars)	Total Cost Per Course (Dollars)	Annual Depreciation (Dollars)
Tractors	3	1,970	5,910	441
Trucks	1.1	2,410	2,651	241
Mowing Equipment				
Green Mowers	5.8	423	2,453	448
Tee Mowers	1.1	586	645	117
Fairway Mowers	1.8	2,095	3,771	356
Rotary Type Mowers	4	238	952	58
Maintenance Equipment				
Aerifiers	1	900	900	162
Sprayers	1	901	901	80
Verticutters	1	567	567	51
Other[a]	6	497	2,982	373
Rental Equipment				
Power Carts	21.8	1,188	25,898	4,424
Hand Carts	35.2	18	634	114
Golf Clubs	2	150	300	27
Standard Equipment[b]	--	--	1,178	158
Total	85		49,742	7,050

[a]Other includes a variety of those maintenance items other than the ones above and are shown in Appendix C. Each item was calculated separately and averaged for this category.

[b]All standard equipment was based on items shown in Appendix C.

There was a wide range in the size and type of maintenance items used on the courses. This was due primarily to differences in course designs, topography and amount of patronage. Maintenance equipment was responsible for 11 percent of the total cost of equipment.

For the four nine hole urban golf courses total equipment cost was $19,513 per course (Table XII). Annual depreciation cost on equipment items averaged $2,281. Rental equipment amounted to $6,229 per course, or 33 percent of total equipment cost. Power carts were the most important item of rental equipment and were generally leased from manufacturers by the club professional. Since the nine hole courses operated on a much smaller scale than the 18 hole courses, mowing and maintenance equipment costs were much lower. In many cases, various equipment items were used to perform more than one task on the golf courses. Total equipment cost per hole averaged $2,763 for the 18 hole courses and $2,167 for the nine hole courses.

Capital investment summary. Capital investment per golf course for the nine 18 hole courses averaged $494,309 (Table XIII). Construction costs averaged $249,605 per course and accounted for 50 percent of the total capital invested. Land costs averaged $194,962 per course and represented 39 percent of the investment. Equipment costs averaged $49,742 per course and accounted for 11 percent of the total capital investment.

For the four nine hole courses, total investment per course was $302,988. Land costs accounted for $171,156, or 56 percent of the total;

TABLE XII

ESTIMATED COSTS PER UNIT OF EQUIPMENT, TOTAL COSTS AND ANNUAL DEPRECIATION FOR MAJOR ITEMS OF EQUIPMENT USED IN THE OPERATION OF FOUR 9 HOLE URBAN GOLF COURSES, TENNESSEE, 1969

Item	Average Number Per Course (Unit)	Cost Per Unit (Dollars)	Total Cost Per Course (Dollars)	Annual Depreciation (Dollars)
Tractors	2	2,675	4,350	261
Trucks	1	2,525	2,525	227
Mowing Equipment				
Green Mowers	3	468	1,404	112
Tee Mowers	1	505	505	101
Fairway Mowers	1.1	1,780	1,958	200
Rotary Type Mowers	2	209	418	32
Maintenance Equipment				
Aerifiers	1	300	300	50
Sprayers	1	450	450	44
Verticutters	1	600	600	63
Other[a]	4	116	464	87
Rental Equipment				
Power Carts	5.5	1,045	5,757	978
Hand Carts	21	17	357	64
Golf Clubs	1	125	125	25
Standard Equipment[b]	--	--	300	37
Total	45		19,513	2,281

[a]Other includes a variety of those maintenance items other than the ones above and are shown in Appendix C. Each item was calculated separately and averaged for this category.

[b]All standard equipment was based on items shown in Appendix C.

TABLE XIII

SUMMARY OF ESTIMATED CAPITAL INVESTMENT PER GOLF COURSE, 13 URBAN GOLF COURSES, TENNESSEE, 1969

Item	Estimated Investment Per Golf Course			
	9 Hole		18 Hole	
	Dollars	Percent of Total	Dollars	Percent of Total
Land	171,156	56	194,962	39
Construction Cost	112,319	37	249,605	50
Equipment	19,513	7	49,742	11
Total	302,988	100	494,309	100

construction costs, $112,319, or 37 percent; and equipment costs, $19,513, or 6 percent.

Annual Operating Costs

Annual operating costs are subject to wide fluctuations. These fluctuations are often the result of factors beyond the control of the management of the golf course. A prolonged drought, for example, may require more intensive care of the golf course and, thus, add considerably to water and labor costs. The most important factor exerting an influence upon annual operating costs, however, is the volume of patronage. Increased patronage may result in added operating costs both for the clubhouse and for the golf course. To a large degree, the extent to patronage on a golf course is controllable, since it is determined primarily by the golfing operation. A well-conditioned and managed golf course, for instance, is more likely to attract more golfers, and thus annual operating costs would be greater.

Annual operating costs for the nine 18 hole courses averaged $110,123 per course, or $6,118 per hole. For the four nine hole courses, annual operating costs averaged $57,999 or $6,444 per hole (Table XIV).

Variable costs. Variable costs for the 18 hole courses were $98,111 per course, or 89 percent of the annual operating costs. This amounted to a variable cost of $5,450 per golf hole. Maintenance items, such as labor, fertilizer and fungicides, seeds, gasoline and oil, repairs and utilities, accounted for 73 percent of the variable operating

TABLE XIV

ANNUAL OPERATING COST PER GOLF COURSE, 13 URBAN GOLF COURSES, TENNESSEE, 1969

	9 Hole			18 Hole		
	Annual Costs (Dollars)	Percent of Subtotal	Costs Per Hole (Dollars)	Annual Costs (Dollars)	Percent of Subtotal	Costs Per Hole (Dollars)
Variable Costs						
Labor	32,595	62	3,622	60,992	62	3,388
Fertilizer and fungicides	1,739	3	193	2,876	3	160
Seeds	474	1	53	1,093	1	61
Gasoline and oil	490	1	54	1,363	1	76
Repairs	1,463	3	163	2,492	3	138
Utilities	1,584	3	176	2,776	3	154
Advertising	20	---	2	92	---	5
Golf shop items	7,500	14	833	12,944	13	719
Snack bar items	7,000	13	778	13,483	14	749
Subtotal	52,865	100	5,874	98,111	100	5,450
Fixed Costs						
Taxes	80	2	9	216	2	12
Insurance	512	10	57	710	6	39
Depreciation	2,705	53	301	5,031	42	279
Interest	1,837	35	204	6,055	50	336
Subtotal	5,134	100	570	12,012	100	667
TOTAL ANNUAL OPERATING COSTS	57,999		6,444	110,123		6,118

costs and averaged $71,592. This resulted in a maintenance cost of $3,977 per hole.[5]

Variable costs for the four nine hole courses were $52,865 per course, or 91 percent of the annual operating costs. This amounted to a variable cost of $5,874 per golf hole. Maintenance costs accounted for 72 percent of the variable operating costs and averaged $38,345 per course, or $4,261 per hole.

(a) Labor cost. Labor cost for the nine 18 hole courses amounted to $60,992 per course and represented 62 percent of the total variable costs (Table XIV, page 79). This was equivalent to $3,388 per golf hole. Labor accounted for 86 percent of the cost of maintaining the golf courses in playing condition.

Labor cost for the four 9 hole courses amounted to $32,959 per course and represented 62 percent of the total variable costs. This was equivalent to $3,621 per hole. Eighty-five percent of the maintenance costs for these golf courses was for labor.

Labor characteristics and costs attributed to clubhouse and maintenance personnel are shown in Table XV. Fifty-one percent of the total labor costs for the 18 hole golf courses was attributed to clubhouse

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[5]In a survey of 50 country clubs in 1966-67, the National Golf Foundation reported that maintenance costs averaged $4,060 per hole for 1,098 holes of golf. Labor costs accounted for 63 percent of these costs. On a geographical basis, courses located in the South and Midwest had approximately the same maintenance costs and such costs were considerably lower than they were for courses located in the East and Far West (see Appendix E). The same survey revealed that over the 1958-67 period, course maintenance costs increased an average of $1,242 per hole, or 44 percent.

TABLE XV

LABOR CHARACTERISTICS AND ESTIMATED LABOR COSTS, 13 URBAN GOLF COURSES, TENNESSEE, 1969

Source	9 Hole	18 Hole
Clubhouse Personnel		
Permanent labor		
Number[a]	2	3
Hours per week		
April-September	49	75
October-March	41	48
Annual cost	$19,125	$29,481
Seasonal labor		
Number	1	1
Hours per week		
April-September	20	40
Annual cost	$ 300	$ 1,500
Total clubhouse labor cost	$19,425	$30,981
Percent clubhouse labor cost is of total labor cost	60	51
Maintenance Personnel		
Permanent labor		
Number[a]	3	5
Hours per week		
April-September	28	45
October-March	25	36
Annual cost	$11,951	$26,952
Seasonal labor		
Number	2	3
Hours per week		
April-September	30	40
Annual cost	$ 1,219	$ 3,059
Total maintenance labor cost	$13,170	$30,011
Percent maintenance labor cost is of total labor cost	40	49
Total Labor Cost	$32,595	$60,992

[a]For the four 9 hole golf courses, the permanent labor force amounted to two persons and included the club professional, whose salary averaged $12,645 annually. For the nine 18 hole golf courses, the permanent labor force included two laborers and the club professional. The club professional's salary averaged $21,723 annually.

labor and 49 percent to maintenance labor. Clubhouse personnel for the nine 18 hole courses generally included one club professional and two permanent laborers who helped with the operation of the pro shop and snack bar. One seasonal laborer was generally hired during the summer months. All clubhouses were operated seven days a week and on a year-round basis. Generally the clubhouses were open from sunup to sundown. Clubhouse personnel work 75 hours per week during the April to September season and 48 hours per week during the October to March season.

The annual salary of the club professional employed at the 18 hole courses averaged $21,723 and accounted for approximately 70 percent of the costs of the clubhouse labor. Seasonal clubhouse labor costs were $1,500 annually.

Maintenance personnel for the 18 hole courses averaged five permanent laborers and one greens superintendent. An average of three seasonal laborers were hired during the summer months. The hours worked per week by the permanent labor force was 45 hours during the April to September season and 36 hours during the October to March season.

The cost of the permanent maintenance labor force averaged $26,952 per course for the 18 hole courses, or $1,497 per hole. The greens superintendent's salary averaged $6,836. Seasonal maintenance labor costs averaged $3,059 per course, or $170 per hole.

For the four 9 hole courses, clubhouse personnel consisted of one club professional and one permanent laborer. One seasonal laborer was generally hired during the summer months. Like the 18 hole courses, the clubhouses remained open seven days a week and on a year round

basis. The permanent labor force worked 49 hours per week during the April to September season and 41 hours per week during the October to March season.

Total annual labor cost for the nine hole courses averaged $32,595 per course. Clubhouse labor cost accounted for 60 percent of the total cost, or $19,425. The average salary of the club professional employed at these courses was $12,645 and accounted for 65 percent of the total annual clubhouse labor costs.

Maintenance labor cost for the nine hole courses averaged $13,170 per course. The permanent maintenance personnel worked 28 hours per week during the April to September season and 25 hours per week during the October to March season. Three of the four 9 hole courses were part of a municipal park system in which the permanent labor force used for maintaining the golf course was also used for maintaining other recreational facilities in the park.

(b) Other costs. The cost of items sold in the golf shop and snack bar accounted for 27 percent of total variable costs for the nine and 18 hole golf courses. The annual cost of items sold through the golf shop was $12,944 per course and accounted for 13 percent of the variable costs. Annual cost of items sold through each snack bar was $13,483, and accounted for 14 percent of the variable costs (Table XIV, page 79.

For the four 9 hole courses, the cost of items sold in the golf shop and snack bar accounted for 27 percent of total variable costs.

The annual cost of the golf shop items was $7,500 per shop, or 14 percent of the variable cost. Annual cost of items sold through the snack bar was $7,000 per snack bar and represented 13 percent of the variable cost. The percentage cost of items sold in the golf shop and the snack bar, as a part of total variable costs, were essentially the same for the 18 and nine hole courses.

Annual cost of fertilizers and fungicides was $2,786 per course for the 18 hole courses and $1,739 per course for the nine hole courses. This represented a cost per hole of $160 and $193, respectively. Fertilizers and fungicides were generally purchased at bulk rate prices.

All 13 urban courses had different fertilization and fungicide programs. This was expected since wide differences existed in the type of soil, topography, irrigation and in the size of the golf course. In general, lime was applied annually in the fall to the tees, fairways and greens. A nitrogen fertilizer was generally applied to the greens once a month at an average rate of two pounds for every 1000 square feet of green.

No general fungicide application program was discernible. Dextron was the most common chemical used for disease control and was generally applied at an average rate of five ounces per 1000 square feet of green. The major diseases affecting the greens were dollar spot and helminthosporum. The sodweb worm and grub worm were the major pests affecting the greens on all 13 courses. Chlorodane and malathion were the most commonly used chemicals applied to the greens to combat these pests.

The annual cost of utilities for the 18 hole courses was $2,776 per course and for the nine hole courses, $1,584. These costs

represented 3 percent of total variable costs for both the nine and 18 hole courses. All 13 urban courses used municipal utilities. Public pay telephones and water fountains were available at all the courses.

Annual repair cost for the 18-hole courses averaged $2,492 per course, or 3 percent of the variable costs. Of this total, annual equipment repairs accounted for $1,687 per course, or 67 percent of the repair cost. This represented an annual equipment repair cost of $94 per hole. Miscellaneous repair costs, which included the costs of lumber, sand and hay for coverage of winter greens, was $805 per course, or 33 percent of the total repair costs.

For the nine hole courses, annual repair cost averaged $1,463 per course, or 3 percent of the variable costs. Annual equipment repairs accounted for 63 percent of the repair costs, or $925. Thus, the cost of annual equipment repairs was $103 per golf hole. Miscellaneous repair costs averaged $538 per course, or 37 percent of all repair costs.

Annual cost of gasoline and oil for the 18 and nine hole courses was $1,363 and $490 per course, respectively. For the 18 hole courses, the costs for gasoline and oil accounted for 1 percent of total variable costs and represented an annual cost of $76 per hole. For the nine hole courses, such costs also accounted for 1 percent of total variable costs but represented an annual cost of only $54 per hole.

Annual seed cost for the 18 and nine hole courses was $1,093 and $474 per course, respectively. For the 18 hole courses this represented an annual seed cost of $61 per hole, and for the nine hole courses, $53 per hole. Seeding programs varied considerably among the 13 urban

courses and no common program was discernible. Overseeding bermuda grass with rye grass, however, was the practice used by six of the 13 courses.

Annual advertising cost was negligible for the nine and 18 hole urban golf courses. Except for road signs, the municipalities generally did not advertise. Advertisements indicating the services offered by the club professional, however, were made, and these costs averaged $92 per course for the 18 hole courses and $20 per course for the nine hole courses.

Fixed costs. Fixed costs for the 18 hole courses averaged $12,012 per course, or 11 percent of the total annual operating costs (Table XIV, page 79). This represented a fixed cost of $667 per golf hole. Annual interest charges accounted for the major share, $6,055 or 50 percent, of the fixed costs. Annual depreciation cost for buildings and ancillary facilities and equipment items accounted for $5,031, or 42 percent, of the fixed costs. Buildings and ancillary facilities accounted for 48 percent, or $2,405, of the depreciation cost while equipment items accounted for 52 percent, or $2,626.[6]

All the municipalities carried insurance on the buildings and ancillary facilities. In general, the insurance policies covered all the recreational facilities within the park system and thus the insurance

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[6]The annual depreciation cost of power carts was not included in the depreciation cost charged to equipment on the urban golf courses since their annual upkeep was generally the responsibility of the manufacturer.

cost charged to the golf course was difficult to ascertain. Rough estimates provided by the municipal officials resulted in annual insurance costs averaging $423 per facility for the 18 hole courses and $388 per facility for the nine hole courses. In addition, all the club professionals carried insurance to cover the contents of the pro shop and snack bar. Average annual costs for this insurance averaged $287 per facility for the 18 hole courses and $133 per facility for the nine hole courses.

The golf course managers were asked to estimate the cost of vandalism at their respective courses. Acts of vandalism ranged from thefts to mutilation of putting greens. The annual cost of vandalism ranged from $200 to $4,000 per course with the average cost for the 18 and nine hole courses being $1,133 and $313, respectively. Vandalism was more prevalent at those courses which were not fenced and were adjacent to low income housing project areas.

Since the 13 urban courses were municipally operated, there was no charge for real estate and property taxes. A retailer's license, however, was required for the operation of the pro shop and snack bar. Annual costs for such licenses varied widely for the 13 courses. For the 18 hole courses the annual cost averaged $216 per course and for the nine hole courses the cost averaged $80 per course.

Annual Gross Income

There were four major sources of income for the 13 urban golf

courses:[7] (1) green fees, (2) rental fees, (3) income from operating the golf shop and (4) income derived from the snack bar. The contribution of each source to gross income varied widely.[8] Annual gross income averaged $150,990 per course for the 18 hole courses and $61,640 per course for the nine hole courses (Table XVI).

Green fees. The daily green fee ticket, or the charge for playing on the golf course for a given day, was the principal source of income for all urban courses. For the nine 18 hole courses, green fees accounted for 57 percent of the annual gross income, and for the four 9 hole courses, 48 percent. In establishing green fee rates, all 13 golf courses charged competitive rates based on charges levied at other courses in the area.

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[7]Golf lessons given by the club professional were not included in annual gross income to the golf course but were recorded as part of the professional's salary. Seven of the 13 professionals gave golf lessons and the income obtained by these professionals averaged $1,260 per year.

[8]Green fees were the only source of income for the 13 urban golf courses where all the gross income accrued to the respective municipalities. Income from rentals accrued to the club professional as part of his salary. Power carts, for example, were operated by the club professional through a leasing arrangement with the manufacturer of the carts. The most common form of leasing arrangement was based on a percentage of income from the cart rentals in which 60 percent went to the professional and 40 percent to the manufacturer. The manufacturer, in turn, provided annual upkeep for the power carts. For purposes of this study, a 60-40 percent leasing arrangement between the club professional and manufacturer was assumed for all 13 courses. Income received from the golf shop and snack bar was shared between the club professionals and the respective municipalities. A contractual arrangement existed between the two parties in which generally the major share of the income received from the golf shop and snack bar went to the club professional as part of his salary. This arrangement varied for all 13 courses. For purposes of this study, a contractual arrangement was assumed whereby 85 percent of income from the golf shop and the snack bar accrued to the professional and 15 percent to the municipality.

TABLE XVI

ESTIMATED ANNUAL GROSS INCOME, FOUR 9 HOLE AND NINE 18 HOLE URBAN GOLF COURSES, TENNESSEE, 1969

Income Source	Estimated Annual Gross Income			
	9 Hole		18 Hole	
	Dollars	Percent of Total	Dollars	Percent of Total
Green Fees	29,664	48	86,492	57
Rental Fees				
Power Carts	6,262	--	16,335	--
Hand Carts	2,087	--	5,167	--
Lockers	75	--	352	--
Golf Clubs	40	--	119	--
Subtotal	8,464	14	21,973	15
Golf Shop	12,315	20	20,527	14
Snack Bar	11,197	18	21,998	14
Total	61,640	100	150,990	100

General markups in price to compensate for operational and maintenance costs were also taken into consideration. None of the 13 courses used promotional green fee rates in establishing the operation of the golf course. In general, seasonal and group green fee rates were not offered to those who played the courses.[9]

Rental fees. Income from rental equipment amounted to $21,973 per course, or 15 percent of the annual gross income, for the 18 hole courses and $8,464, or 14 percent, for the nine hole courses. The major source of rental income, 74 percent, came from the rental of power carts for both the nine and 18 hole golf courses. Hand carts, those which are pulled manually by the golfers, accounted for about one-fourth of rental income for both the nine and 18 hole golf courses.

Golf shop. Annual gross income from the operation of the golf shop for the nine 18 hole courses averaged $20,527 per course and for the four 9 hole courses, $12,315. This constituted 14 and 20 percent, respectively, of annual gross income received from the golfing operation. The major sources of income received from the golf shop were from the sale of wearing apparel, golfing equipment and golf supplies.

Snack bar. Annual gross income from the operation of the snack bar for the nine 18 hole golf courses amounted to $21,998 per course, or 14 percent of the annual gross income, and for the four 9 hole

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[9]Retired individuals represented the only group receiving special rates on all 13 urban golf courses. A small annual fee was generally charged and use of the courses was restricted to weekdays.

courses, $11,197, or 18 percent. The major sources of income received from the snack bar were from the sale of sandwiches and beverages. Alcoholic beverages were sold at all 13 urban golf courses.

Net Returns to Capital

Net income received from the operation of the nine 18 hole golf courses averaged $40,867 per golf course (Table XVII). This represented an 8.2 percent return on capital investment to the respective municipalities. Net income for the four 9 hole golf courses averaged $3,641 per golf course, or a 1.2 percent return on capital investment.

III. RURAL GOLF COURSES

The golf course operations of the rural golfing associations were different from the operation of the courses located in the urban sector. Unlike the municipal courses, the rural courses were part of a total recreational complex that offered a variety of recreational activities to the rural community. However, participation at the golf courses and related recreational facilities were subject to the rules and regulations of the associations. Thus, managerial and operational requirements of the rural golf courses varied widely.

The 10 rural golfing associations studied were located in rural communities that had an average population of 2,475 (Table XVIII). Seven of the 10 counties in which the associations were located experienced an out-migration of population from 1950 to 1960. Seventy-nine percent of the population in these 10 counties was characterized as rural and 39 percent was classified as rural farm.

TABLE XVII

ESTIMATED GROSS INCOME, ANNUAL OPERATING COSTS AND NET RETURNS PER GOLF COURSE, 13 URBAN GOLF COURSES, TENNESSEE, 1969

Item	Dollars			
	9 Hole		18 Hole	
	Cost	Returns	Cost	Returns
Gross Income				
Green fees		29,664		86,492
Rental fees		8,464		21,973
Golf shop		12,315		20,527
Snack bar		11,197		21,998
Subtotal		61,640		150,990
Annual Operating Costs				
Variable costs				
Labor	32,595		60,992	
Fertilizer and fungicides	1,739		2,876	
Seeds	474		1,093	
Gasoline and oil	490		1,363	
Repairs	1,463		2,492	
Utilities	1,583		2,776	
Advertising	20		92	
Golf shop items	7,500		12,944	
Snack bar items	7,000		13,483	
Subtotal	52,865		98,111	
Fixed costs				
Taxes	80		216	
Insurance	512		710	
Depreciation	2,705		5,031	
Interest	1,837		6,055	
Subtotal	5,134		12,012	
Total Costs	57,999		110,123	
Net Income				
Gross income	61,640		150,990	
Total costs	57,999		110,123	
Net income	3,641		40,867	

TABLE XVIII

GENERAL POPULATION CHARACTERISTICS OF THE COUNTIES IN WHICH THE 10 RURAL GOLFING ASSOCIATIONS STUDIED WERE LOCATED, TENNESSEE, 1969

Rural County	Population 1960		Percent Change in County Population 1950-60	Percent County is of State in Total Population 1960	Percent Urban Population of County 1960	Percent Rural Nonfarm Population of County 1960	Percent Rural Farm Population of County 1960	Total Nonwhite Population of County 1960	Percent Nonwhite Population of Total County 1960
	County	Community							
1	12,197	1,900	-10.3	0.3	0.0	39.1	60.9	121	1.0
2	15,557	4,510	-13.4	0.7	20.3	42.8	37.0	1,757	7.3
3	19,135	4,668	1.4	0.5	24.4	50.7	24.9	6	---[a]
4	12,059	2,487	-14.5	0.3	0.0	43.2	56.8	614	5.2
5	14,661	2,817	-16.5	0.4	19.2	44.2	36.6	77	.5
6	36,217	2,100	8.0	1.0	21.8	47.0	31.1	4,126	11.4
7	24,227	1,109	-13.4	0.7	20.3	42.8	37.0	1,757	7.3
8	14,594	2,022	-12.2	0.4	0.0	43.5	56.5	3,566	24.4
9	29,537	2,033	-11.8	0.8	42.3	29.1	28.5	4,363	14.8
10	60,655	1,100	.9	1.7	61.0	19.6	19.5	20,675	34.1
Total	238,839	24,746	-81.8	6.8	209.3	402	388.8	37,062	105.9
Average	23,884	2,475		.7	21	40	39	3,706	11

[a]Less than .05 percent.

Source: Cleland, Charles L., Selected Population and Agricultural Statistics for Tennessee Counties, Bulletin 419 (Knoxville: Agricultural Experiment Station, University of Tennessee, June, 1967), pp. 10-12.

Characteristics

Physical. Table XIX indicates the physical characteristics of the 10 rural golf courses studied. These courses were relatively new, having been in operation from 1 to 10 years. All were 9 hole courses. Par averaged 36 strokes and total yardage averaged 3,212 yards. Average participant capacity per day was 128 persons. The estimated total patronage for 1968 ranged from 500 to 8,000 participants with the older courses being patronized much more than the newer courses.

Financial. Financing of the 10 rural golfing associations studied followed a common pattern. Initial interest in the development of the facilities was generated by individuals or various interested groups. This generally precipitated community interest. An examination of available resources, costs and type of recreational facilities desired by the community normally followed strong community interest.

To acquire the required facilities, nonprofit corporations were organized by individuals within the community and chartered in accordance with Tennessee laws. The initial source of capital for the development of the facilities was obtained by soliciting a minimum number of memberships for the golfing associations. This objective was generally accomplished by the initial directors of the corporation. For these 10 golfing associations the initial size of the membership averaged 172 members. The average initial cost of a membership was $185.[10]

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[10]The most common class of membership was the family membership.

TABLE XIX

PHYSICAL CHARACTERISTICS OF 10 RURAL GOLF COURSES, TENNESSEE, 1969

Golf Course Number	Years of Operation	Par	Total Yardage	General Terrain	Golf Course Acreage	Total Acreage	Capacity Per Day	Total Patronage 1968
1	4	36	3,172	Rolling	55	70	150	8,000
2	10	36	3,300	Hilly	60	65	150	6,300
3	2	36	3,200	Hilly	75	140	100	2,500
4	2	36	3,550	Hilly	80	88	100	1,000
5	2	36	3,182	Hilly	40	70	100	500
6	1	36	3,200	Hilly	90	96	150	500
7	3	36	3,099	Hilly	69	127	130	1,000
8	1	36	3,400	Flat	70	104	150	1,500
9	3	35	2,750	Hilly	65	100	150	500
10	9	36	3,267	Hilly	85	106	100	7,300
Total	37	359	32,120		689	966	1,280	29,100
Average	4	36	3,212		69	97	128	2,910

In addition to initial membership fees, it was necessary for the associations to sell bonds in order to defray the cost of land acquisition, construction costs of the facilities and architectural fees. All 10 of the golfing associations studied took advantage of the financial provisions provided in the program developed by the Farmers Home Administration (FHA) of the United States Department of Agriculture which strongly encouraged the development of this type recreational facility. In this program the type of bond sold for the purposes indicated was guaranteed insofar as the payment of principal and interest was concerned by the full faith and credit of the United States Government.

These federal funds provided an average of 76 percent of the total investment required to develop the necessary facilities for the 10 golfing associations.[11] The interest rate for such bonds averaged 5 percent and the repayment period for the bonds was generally extended over a period of 40 years. In addition, the FHA allowed the associations to miss payments on the principal and interest for the first two years and to spread payments for the balance due equally over a 38 year period.

Managerial. All 10 rural golfing associations were managed by a Board of Directors elected by the members. The Board generally consisted of 10 to 15 members whose primary responsibility was establishing guidelines for the operation of the clubhouse and golf course. The Board established annual membership dues, green fees and hired personnel

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[11]Other sources of capital were loans from private individuals and banks.

to operate the golf course. In general, major decisions concerning the operation of the association were subject to the membership's approval on a one member one vote basis.

Generally, the golf club manager handled both the clubhouse duties and the actual operation of the golf course. None of the courses had a greens superintendent hired specifically to maintain the golf course. The golf course managers averaged 40 years of age and had an average of 12 years of education.

Similar to the urban sector, the working arrangements between the golf club manager and the overall management varied among the 10 courses. Eight of the 10 club managers received a minimum base salary from the golfing association. Further, nine of the 10 managers received additional income from the sale of rental equipment, food and beverages, and merchandise in the pro shop.

Capital Investments

Land. All 10 golfing associations were located on what was previously rural farmland. Thus, unlike the urban sector, land costs were not a prohibiting development factor. All land purchases by the associations were made since 1960. Acres of land purchased averaged 97 acres for each association resulting in an initial investment of $31,968 (Table XX). The present market value of the land purchased by the golfing associations averaged $72,080 for each association which is an increase of 125 percent of the initial value.

TABLE XX

NUMBER OF ACRES, ESTIMATED INITIAL COST AND PRESENT MARKET VALUE OF LAND USED FOR 10 RURAL GOLFING ASSOCIATIONS, TENNESSEE, 1969

Golf Course Number	Golf Course Acreage	Total Acreage	Dollars				
			Initial Land Cost of Golfing Association		Present Market Value of Land for Golfing Association		Present Market Value of Adjacent Land Per Acre
			Per Acre	Total	Per Acre	Total	
1	55	70	400	28,000	1,000	70,000	750
2	60	65	300	19,500	2,384	154,960	2,384
3	75	140	243	34,020	321	44,940	350
4	80	88	350	30,800	1,000	88,000	1,100
5	40	70	500	35,000	1,000	70,000	1,000
6	90	96	422	40,512	700	67,200	700
7	69	127	150	19,050	400	50,800	350
8	70	104	400	41,600	400	41,600	400
9	65	100	500	50,000	750	75,000	750
10	85	106	200	21,200	550	58,300	550
Total	689	966	3,465	319,682	8,505	720,800	8,334
Average	69	97	346	31,968	850	72,080	833

The present estimated market value of land adjacent to the golfing associations equaled or exceeded the present market value of the land used by eight of the 10 associations. The management of three associations were considering buying additional land for expansion purposes.

All 10 of the recreational associations were located on or near major highways. Three of the associations had dirt and gravel roads leading from the main highway to the clubhouse which measured approximately one quarter of a mile.

Construction costs. Construction costs for the 10 rural nine hole golfing associations are shown in Table XXI. The total cost of construction averaged $134,656 per association. The costs of buildings and ancillary facilities accounted for the major share, $84,242 per association, or 63 percent, of total construction costs. Golf course construction accounted for 37 percent of the total costs, or $50,414. Thus, the average cost of construction per golf hole was $5,602.

(a) Buildings and ancillary facilities. The estimated construction cost of clubhouses for the 10 golfing associations averaged $51,113 per clubhouse, or 38 percent of total construction cost (Table XXI). The range in construction cost for the clubhouses was from $22,360 to $120,000 (Table XXII). The average size of the clubhouses was 3,500 square feet and thus the average cost per square foot was $14.60.

The clubhouses for all 10 golfing associations were the focal point of activities. The clubhouses contained the pro shops, snack bars, lounges, bars, rest rooms and lockers. In addition, they contained

TABLE XXI

ESTIMATED TOTAL CONSTRUCTION COSTS PER ASSOCIATION,
10 RURAL 9 HOLE GOLFING ASSOCIATIONS,
TENNESSEE, 1969

Item	Estimated Total Cost (Dollars)	Percent of Total
Buildings and Ancillary Facilities		
Clubhouses	51,113	38
Storage Shed	1,869	1
Parking Lot	2,450	2
Swimming Pool	25,307	19
Tennis Courts	3,503	3
Subtotal	84,242	63
Golf Course		
Putting Greens	21,187	16
Tees	5,566	4
Fairways	12,023	9
Hazards	879	1
Irrigation	10,759	7
Subtotal	50,414	37
Total	134,656	100

TABLE XXII

ESTIMATED SIZE, CONSTRUCTION COST AND ANNUAL DEPRECIATION OF BUILDINGS AND ANCILLARY FACILITIES, 10 RURAL GOLFING ASSOCIATIONS, TENNESSEE, 1969

Golf Course Number	Type	Estimated Size (Sq. Ft.)	Construction Cost (Dollars)	Estimated Life (Years)	Annual Depreciation (Dollars)
Clubhouse					
1	Concrete	1,250	12,000	40	300
2	Brick	5,000	120,000	40	3,000
3	Brick	3,400	50,000	40	1,250
4	Brick	3,300	50,000	40	1,250
5	Brick	3,750	75,000	40	1,875
6	Brick	2,500	35,770	40	894
7	Brick	4,000	60,000	40	1,500
8	Brick	6,400	50,000	40	1,250
9	Concrete	2,400	22,360	40	309
10	Brick	3,000	36,000	40	900
Subtotal		35,000	511,130	400	12,528
Average		3,500	51,113	40	1,253
Storage Shed					
1	Metal	750	4,000	40	100
2	Wood	1,000	300	20	15
3	Concrete	800	3,000	40	75
4	Wood	800	1,000	20	50
5	Concrete	675	3,000	40	75
6	Wood	800	300	20	15
7	Wood	700	1,400	20	70
8	Wood	1,500	2,500	20	125
9	Concrete	500	2,190	40	58
10	Wood	600	1,000	20	50
Subtotal		8,125	18,690	280	633
Average		812	1,869	28	63

TABLE XXII (continued)

Golf Course Number	Type	Estimated Size (Sq. Ft.)	Construction Cost (Dollars)	Estimated Life (Years)	Annual Depreciation (Dollars)
Parking Lot					
1	Gravel	20,000	1,000	20	50
2	Gravel	13,000	5,000	20	250
3	Paved	15,000	2,500	40	62
4	Gravel	18,000	3,000	20	150
5	Gravel	14,000	3,000	20	150
6	Gravel	15,000	1,000	20	50
7	Gravel	22,500	2,000	20	100
8	Gravel	24,000	3,000	20	150
9	Gravel	15,000	3,000	20	150
10	Gravel	12,000	1,000	20	50
Subtotal		168,500	24,500	220	1,162
Average		16,850	2,450	22	116
Swimming Pool					
1	Concrete	4,000	25,000	30	883
2	Concrete	3,500	26,000	30	867
3	Concrete	4,500	38,000	30	1,267
4	Concrete	3,654	32,000	30	1,067
5	Concrete	1,500	10,000	30	333
6	Concrete	3,300	19,800	30	660
7	Concrete	4,200	25,000	30	833
8	Concrete	5,500	30,000	30	1,000
9	Concrete	2,600	22,270	30	742
10	Concrete	3,800	25,000	30	833
Subtotal		36,554	253,070	300	8,485
Average		3,655	25,307	30	848
Tennis Court					
1	Asphalt	8,640	3,705	15	247
2	Asphalt	15,000	7,824	15	522
3	Asphalt	11,322	3,900	15	260
4	Asphalt	12,240	4,160	15	277

TABLE XXII (continued)

Golf Course Number	Type	Estimated Size (Sq. Ft.)	Construction Cost (Dollars)	Estimated Life (Years)	Annual Depreciation (Dollars)
5	Asphalt	10,000	3,500	15	233
6	Asphalt	8,500	2,460	15	164
8	Asphalt	9,000	2,678	15	179
9	Asphalt	11,000	3,900	15	260
10	Asphalt	10,000	2,900	15	193
Subtotal		95,702	35,027	135	2,335
Average		9,570	3,503	15	233
TOTAL			842,417		25,093
AVERAGE			84,242		2,513

dining and recreational rooms which also served as a meeting place for club and community gatherings.

Swimming pools and tennis courts were provided at all 10 golfing associations. In most cases, they were adjacent to the clubhouse and were readily accessible to the snack bar and locker facilities. The average cost of the swimming pools was $25,307 per pool, or $6.92 per square foot. The average cost of the tennis courts was $3,503 per court, or $.37 per square foot.

(b) Golf course. The cost of construction for the 10 nine hole golf courses was $50,414 per course. The major cost item was the putting greens which accounted for 42 percent of total golf course construction costs. As shown in Table XXIII, the average cost per putting green ranged from $1,000 to $4,500 and averaged $2,354. The average cost per square foot was $.60. The total cost of the putting greens was $21,187 per golfing association.

The cost of construction of tees for the 10 golfing associations averaged $620 per tee and $5,566 per course. The range in construction cost for tees was from $255 to $1,500. Common bermuda grass was used on all tees for the 10 courses. The size of tees per course averaged 1,700 square feet and the cost per square foot averaged $.36.

Fairway construction costs averaged $1,336 per fairway and $12,023 per course. Average width of fairways was 75 yards. The most common variety of grass found on the fairways was common bermuda.

All rural courses had an irrigation system for watering fairways, tees and greens. The water supply was generally from a drilled well or

TABLE XXIII

ESTIMATED SIZE AND CONSTRUCTION COST OF GOLF COURSES, 10 RURAL GOLFING ASSOCIATIONS, TENNESSEE, 1969

Golf Course Number	Type	Average Size Per Unit (Sq. Ft.)	Average Cost Per Unit (Dollars)	Total Cost Per Course (Dollars)
Putting Greens				
1	328 Bermuda	3,711	1,341	12,069
2	328 Bermuda	4,000	1,500	13,500
3	328 Bermuda	5,000	2,200	19,800
4	328 Bermuda	3,000	1,000	9,000
5	328 Bermuda	3,000	2,000	18,000
6	Bent Grass	5,000	3,000	27,000
7	Bent Grass	5,000	4,500	40,500
8	328 Bermuda	3,500	4,000	36,000
9	Bent Grass	3,000	3,000	27,000
10	328 Bermuda	4,000	1,000	9,000
Subtotal		39,211	23,541	211,869
Average		3,921	2,354	21,187
Tees				
1	Common Bermuda	600	341	3,065
2	Common Bermuda	1,200	500	4,500
3	Common Bermuda	2,000	400	3,600
4	Common Bermuda	500	255	2,200
5	Common Bermuda	3,300	1,000	9,000
6	Common Bermuda	800	300	2,700
7	Common Bermuda	4,000	1,000	9,000
8	Common Bermuda	3,500	1,500	13,500
9	Common Bermuda	800	400	3,600
10	Common Bermuda	1,000	500	4,500
Subtotal		17,700	6,196	55,665
Average		1,700	620	5,566

TABLE XXIII (continued)

Golf Course Number	Type	Average Size Per Unit (Sq. Ft.)	Average Cost Per Unit (Dollars)	Average Cost Per Course (Dollars)
Fairways				
1	Common Bermuda		481	4,330
2	Common Bermuda		1,000	9,000
3	Common Bermuda		500	4,500
4	Common Bermuda		378	3,400
5	Common Bermuda		2,000	18,000
6	Common Bermuda		1,000	9,000
7	Common Bermuda		4,000	36,000
8	Common Bermuda		2,000	18,000
9	Common Bermuda		1,000	9,000
10	Common Bermuda		1,000	9,000
Subtotal			13,359	120,230
Average			1,336	12,023
Hazards				
1	Sand	300	100	600
3	Sand	200	167	500
4	Sand	240	250	750
5	Sand	300	57	400
6	Sand	620	200	3,200
9	Sand	225	167	500
10	Sand	100	200	200
Subtotal		1,985	1,141	6,150
Average		284	163	879
Irrigation				
1	Pipe-Sprinkler	-	-	7,000
2	Pipe-Sprinkler	-	-	12,000
3	Pipe-Sprinkler	-	-	10,000
4	Pipe-Sprinkler	-	-	10,050
5	Pipe-Sprinkler	-	-	13,000
6	Pipe-Sprinkler	-	-	11,940

TABLE XXIII (continued)

Golf Course Number	Type	Average Size Per Unit (Sq. Ft.)	Average Cost Per Unit (Dollars)	Average Cost Per Course (Dollars)
7	Pipe-Sprinkler	-	-	5,600
8	Pipe-Sprinkler	-	-	16,000
9	Pipe-Sprinkler	-	-	10,000
10	Pipe-Sprinkler	-	-	12,000
Subtotal				107,590
Average				10,759
Total				501,504
Average				50,414

a nearby creek. The cost of the irrigation system averaged $10,759 per course and represented 21 percent of the total construction cost of the golf course.

Equipment costs. Equipment costs for the 10 rural golfing associations averaged $16,935 per course (Table XXIV). Of this cost, $7,488 or 44 percent, was for rental equipment. Power carts were the major rental equipment item with an average of seven per course, costing an average of $1,066 per cart. Total cost of power carts per course was $7,355. Annual depreciation cost on power carts averaged $1,251 per course.

Mowing equipment accounted for 22 percent of total equipment cost. There was an average of two green mowers per course, costing an average of $462 per mower. Each course had a variety of other types of rotary mowers for maintenance purposes. Total cost of these mowers averaged $418 per course.

Capital investment summary. Capital investment per golfing association averaged $183,559 (Table XXV). Construction costs averaged $134,656 per association and accounted for 73 percent of the total capital invested. Land costs averaged $31,968 per association and represented 17 percent of the investment and equipment costs amounted to $16,935, or 10 percent of total capital investment.

Annual Operating Costs

Annual operating costs for the 10 rural golf courses were subject to the same variations as were the courses in the urban sector.

TABLE XXIV

ESTIMATED COSTS PER UNIT OF EQUIPMENT, TOTAL COSTS AND ANNUAL DEPRECIATION FOR MAJOR ITEMS OF EQUIPMENT USED IN THE OPERATION OF 10 RURAL GOLFING ASSOCIATIONS, TENNESSEE, 1969

Item	Average Number Per Course (Unit)	Cost Per Unit (Dollars)	Total Cost Per Course (Dollars)	Annual Depreciation (Dollars)
Tractor	1.2	1,700	2,040	122
Trucks	1	1,500	1,500	135
Mowing Equipment				
Green Mowers	2.1	462	970	175
Tee Mowers	1	505	505	101
Fairway Mowers	1	1,880	1,880	169
Rotary Type Mowers	2	209	418	32
Maintenance Equipment				
Aerifiers	1	300	300	50
Sprayers	1	450	450	44
Verticutters	1	600	600	63
Other[a]	4	116	464	87
Rental Equipment				
Power Carts	6.9	1,066	7,355	1,251
Hand Carts	9	17	153	27
Golf Clubs	--	--	--	--
Standard Equipment[b]	--	--	300	37
Total	31		16,935	2,293

[a]Other includes maintenance items other than the items listed and are shown in Appendix C.

[b]Standard equipment included those items shown in Appendix C.

TABLE XXV

SUMMARY OF ESTIMATED CAPITAL INVESTMENT PER GOLFING ASSOCIATION, 10 RURAL GOLFING ASSOCIATIONS, TENNESSEE, 1969

Item	Estimated Investment Per Golfing Association	Percent of Total
Land	31,968	17
Construction Cost		
Buildings and Related Facilities	84,242	
Golf Course	50,414	
Subtotal	134,656	73
Equipment	16,935	10
Total	183,559	100

Due to the diversity of recreational and related activities at the rural associations, however, additional costs were generally incurred. Management was concerned with the upkeep of the swimming pool, tennis courts and other recreational facilities as well as the upkeep of the golf course and clubhouse.

Annual operating costs for the 10 rural golfing associations averaged $34,869 per association (Table XXVI). This amounted to an annual operating cost of $3,874 per golf hole.

Variable costs. Variable costs for the 10 golfing associations averaged $23,027 per association, or 66 percent of annual operating costs. This amounted to a variable cost of $2,559 per golf hole. Maintenance items, such as labor, fertilizer and fungicides, seeds, gasoline and oil, repairs and utilities accounted for 71 percent of the variable operating costs and averaged $20,890. This resulted in a maintenance cost of $2,321 per hole.

(a) Labor cost. Labor cost for the 10 golfing associations amounted to $15,602 per association and represented 68 percent of the total variable costs (Table XXVI). This was equivalent to $1,734 per golf hole. Labor accounted for three-fourths of the cost of maintenance required to keep the golf courses in playing condition.

Annual clubhouse labor costs averaged $9,012 per association and represented 58 percent of the total annual labor cost (Table XXVII). Clubhouse personnel generally included one manager or club professional and one permanent laborer who usually helped with the operation of the

TABLE XXVI

ANNUAL OPERATING COSTS PER GOLFING ASSOCIATION,
10 RURAL GOLFING ASSOCIATIONS,
TENNESSEE, 1969

Item	Annual Costs (Dollars)	Percent of Subtotal	Costs Per Hole (Dollars)
Variable Costs			
Labor	15,602	68	1,734
Fertilizers and fungicides	1,710	7	190
Seeds	273	1	30
Gasoline and oil	555	2	62
Repairs	1,018	5	113
Utilities	1,732	8	192
Golf shop items	1,196	5	133
Snack bar items	941	4	105
Subtotal	23,027	100	2,559
Fixed Costs			
Interest	4,919	42	547
Taxes	779	6	87
Insurance	2,589	22	288
Depreciation	3,555	30	395
Subtotal	11,842	100	1,317
Total Annual Operating Costs	34,869		3,874

TABLE XXVII

LABOR CHARACTERISTICS AND ESTIMATED LABOR COSTS PER GOLFING ASSOCIATION, 10 RURAL GOLFING ASSOCIATIONS, TENNESSEE, 1969

Item	9 Hole Golf Course
Clubhouse Personnel	
Permanent labor	
Number	2
Hours per week	
April-September	70
October-March	40
Annual cost	$ 8,250
Seasonal labor	
Number	1
Hours per week	
April-September	35
Annual cost	762
Total clubhouse labor cost	$ 9,012
Percent clubhouse labor cost is of total labor cost	58
Maintenance Personnel	
Permanent labor	
Number	1
Hours per week	
April-September	52
October-March	48
Annual cost	$ 5,214
Seasonal labor	
Number	2
Hours per week	
April-September	45
Annual cost	$ 1,376
Total maintenance labor cost	$ 6,590
Percent maintenance labor cost is of total labor cost	42
Total Labor Cost	$15,602

pro shop and snack bar. The club manager's primary responsibility was the overall management of the clubhouse and golf course. His duties ranged from collecting tickets, to selling merchandise in the clubhouse, to maintenance work on the golf course.

All clubhouses and golf courses were open seven days a week and on a year round basis. Generally, the clubhouses were operated from 7:00 a.m. to 8:00 p.m., and the clubhouse labor worked an average of 70 hours per week during the April to September season and 40 hours during the October to March season. One seasonal laborer was hired during the April to September period to assist with clubhouse operations at an average annual cost of $762 per association.

Annual maintenance labor cost for the 10 rural golfing associations averaged $6,590 per association. One permanent laborer was hired on an annual basis for an average cost of $5,214. The hours worked per week by the permanent laborer during the April to September season was 52 hours and for the October to March period, 48 hours.

(b) Other costs. The cost of items sold in the golf shop and the snack bar accounted for 9 percent of the total variable costs for the 10 rural golfing associations (Table XXVI, page 112). The annual cost of items sold through the golf shop was $1,196 per shop and accounted for 5 percent of the variable costs. Annual cost of items sold through each snack bar was $941 and accounted for 4 percent of the variable costs.

Annual cost of fertilizers and fungicides averaged $1,710 per course for the 10 golfing associations. This represented a cost per

hole of $190. The fertilization program varied for all 10 associations but most managers indicated their program followed that suggested by the Agronomy Department of the University of Tennessee.

Annual repair cost averaged $1,018 per association, or $113 per hole. Of this total, annual equipment repairs accounted for $663, or 65 percent of annual repair costs. Miscellaneous repair items used for repairs on the clubhouse and golf courses averaged $355, or 35 percent of total repair costs.

Annual cost of utilities for the golfing associations averaged $1,732 per association, or 8 percent of total variable cost. This included the cost of utilities for the clubhouse, swimming pool and golf course.

Fixed costs. Fixed costs for the 10 rural golfing associations averaged $11,842 per association and accounted for 34 percent of total annual operating costs (Table XXVI, page 112). This represented a fixed cost of $1,317 per golf hole. Annual interest charges on capital investments accounted for the major share, $4,912, or 42 percent, of the fixed costs. Annual depreciation cost for buildings and ancillary facilities and equipment items accounted for $3,555 or 30 percent, of the fixed costs. Buildings and ancillary facilities accounted for 71 percent, or $2,513, of the annual depreciation cost, while equipment items accounted for 29 percent, or $1,042.[12]

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[12]The annual depreciation cost of power carts was not included in the depreciation cost charged to equipment used by the rural golfing associations since their annual upkeep was generally the responsibility of the manufacturer.

All the associations' buildings and their contents, golfing equipment and other facilities were insured. A general comprehensive policy was the most common type of insurance policy used. The cost of insurance averaged $2,589 per association per year.

Annual Gross Income

Sources of income for the 10 rural golfing associations were: (1) annual membership dues, (2) green fees, (3) rental fees, (4) income from operating the golf shop, (5) income from operating the snack bar, (6) income from operating the swimming pool, and (7) income from miscellaneous sources. The contribution of each source of income to annual gross income varied widely.[13] Annual gross income amounted to $39,691 per association (Table XXVIII).

Membership dues. Annual membership dues were the principal source of income for the associations. This source accounted for 67 percent of the annual gross income, or $26,797 per association (Table XXVIII). The associations averaged 192 members and annual membership fees averaged $135. Managers of seven of the 10 associations indicated that the lack

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[13]All income received from membership dues, greens fees, operation of the swimming pool and from miscellaneous sources accrued to the golfing association. However, as was the case for the urban courses, part of the income received from the sale of rentals and from sales in the golf shop and snack bar generally accrued to the club manager as part of his salary. The incomes received from these sources by the club managers varied widely. For purposes of this analysis the same assumptions for prorating income to the urban courses were assumed for prorating the income to the rural courses. For rental income, a 60-40 percent leasing arrangement between the club manager and manufacturer was assumed. For income obtained from operating the golf shop and snack bar, a contractual arrangement was assumed in which 85 percent of gross income accrued to the manager and 15 percent to the association.

TABLE XXVIII

ESTIMATED ANNUAL GROSS INCOME FOR 10 RURAL GOLFING ASSOCIATIONS, TENNESSEE, 1969

Golf Course Number	Dollars							
	Membership Dues	Green Fees	Rental Fees[a]	Golf Shop	Snack Bar	Swimming Pool[b]	Miscellaneous	Total Annual Gross Income
1	8,640	4,910	1,261	4,703	3,135	581	765	23,995
2	19,200	6,857	3,250	3,000	5,000	400	315	38,022
3	16,000	8,700	3,000	1,500	1,500	700	280	31,680
4	36,000	4,606	2,600	6,500	300	834	640	51,480
5	22,176	4,162	4,500	4,000	1,600	1,011	336	37,785
6	22,240	1,000	500	900	600	115	200	25,555
7	24,620	2,226	6,700	4,000	1,500	154	400	39,600
8	24,600	1,000	2,500	1,000	500	200	400	30,200
9	40,500	1,400	1,365	500	100	100	560	44,525
10	54,000	3,000	8,700	2,000	5,600	400	400	74,100
Total	267,976	37,861	34,376	28,103	19,835	4,495	4,296	396,942
Average	26,797	3,786	3,437	2,810	1,983	449	429	39,691

[a]Rental fees include income obtained from renting golf clubs, hand carts, power carts and lockers.

[b]Swimming was a major recreational enterprise at the rural golfing associations.

of sufficient membership was the limiting factor in determining the financial success of the association. The collection of the annual membership fees was a major problem for the management of the associations.

Green fees. Green fees averaged $3,786 per rural association, or about 10 percent of their total annual gross income. This is in sharp contrast to the 57 percent contribution green fees made to total gross income of the urban golf courses. The difference is due primarily to differences in participation rates which are affected by the semiprivate nature of the rural golfing associations and their distance from heavily populated areas. Green fee policies of the rural courses and the use of the course were generally arranged so that members were given priority over nonmembers, such as the giving of prime tee-off times on weekends. Participation by nonmembers was often limited to a given number of times per year and then only when accompanied by a member of the association.

In establishing green fee rates, management personnel of the associations reported that the association's charge was based on a comparison of green fees charged by other golf courses in the area. Markup of green fees was often considered as a means to help meet operational and maintenance costs. Only one golfing association reported offering monthly or seasonal rates.

Rental fees. Income obtained from rental equipment averaged $3,437 per course, or 9 percent of the annual gross income. The major sources of rental income were from renting power carts, hand carts,

lockers and golf clubs with about 75 percent of the rental fees coming from renting power and hand carts. At most of the associations, members could own and use their own power carts. Since power carts generally represented a major source of rental income, this privilege may have limited rental income.

Golf shop. Annual gross income obtained from the operation of the golf shops averaged $2,180 per shop, or 7 percent of the annual gross income. The range in income received from the operation of the golf shop was from $500 to $6,500 per shop and depended primarily on the type and amount of equipment the golf shop stocked. Those in the lower part of the income range had only a small stock of golfing items available, such as golf balls. Those in the upper part of the income range had a much larger and diversified stock, in addition to balls and tees, such as golf clubs and wearing apparel.

Snack bar. Annual gross income received from the snack bar operations averaged $1,983 per snack bar, which represented 5 percent of the total annual gross income. The amount of income received depended heavily upon the type of facilities and food services available at the snack bar. Four of the 10 golfing associations sold beer at the snack bar and the others did not because of association or county laws.

Swimming pool. Annual gross income received from operating the swimming pool averaged $449 per association, or only 1 percent of the annual gross income. Wide variations existed in the income received

from the swimming pool operations. This was probably due to a combination of factors, such as the club policies on the use of the pool by non-members, location of the associations and total membership.

Miscellaneous. Annual gross income obtained from miscellaneous sources was $429 per association. Major sources of miscellaneous income were from tournaments and social events.

Net Returns to Capital

Net income received from the operation of the 10 rural golfing associations averaged $4,822 per association (Table XXIX). This represented a 2.6 percent return on capital investment to the respective golfing associations.

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TABLE XXIX

ESTIMATED GROSS INCOME, ANNUAL OPERATING COSTS AND NET RETURNS PER GOLFING ASSOCIATION, 10 RURAL GOLFING ASSOCIATIONS, TENNESSEE, 1969

Item	Dollars	
	Cost	Returns
Gross Income:		
Membership dues		26,797
Green fees		3,786
Rental fees		3,437
Golf shop		2,810
Snack bar		1,983
Swimming pool		449
Miscellaneous		429
Subtotal		39,691
Annual Operating Costs:		
Variable Costs		
Labor	15,602	
Fertilizer and fungicides	1,710	
Seeds	273	
Gasoline and oil	555	
Repairs	1,018	
Utilities	1,732	
Golf shop items	1,196	
Snack bar items	941	
Subtotal	23,027	
Fixed Costs		
Interest	4,919	
Taxes	779	
Insurance	2,589	
Depreciation	3,555	
Subtotal	11,842	
Total Costs	34,869	
Net Income		
Gross Income		39,691
Total Expenses		34,869
Net Income		4,822

CHAPTER IV

ANALYSIS OF PARTICIPATION IN GOLF

The analysis of participation in golf in Tennessee was based on the user demand model described in Chapter II. The user demand model was used to explain variations in annual participation rates in golf for the urban sector which included golfers sampled at the municipal golf courses in Memphis, Nashville, Knoxville, and Johnson City. The same user demand model was also used to explain variations in annual participation rates of the rural sector golfers sampled at the FHA financed golf courses. In addition to this model, a modified user demand model was developed that used recreational data obtained from golfers selected randomly from a statewide survey made by the Tennessee Department of Conservation.[1]

For purposes of analysis, golfers interviewed at the urban and rural golf courses were divided into five categories: (1) all golfers, (2) golfers who played the courses on weekdays, (3) golfers who played the courses on weekends, (4) golfers who played the courses before 4:00 p.m., and (5) golfers who played the courses after 4:00 p.m. The category, all golfers, was simply an aggregate of the other four categories and served as a basis for comparison for the other categories. The

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[1] Details of the modified user demand model are described under the statewide analysis section on page 184 of this chapter.

categories of weekday and weekend golfers provided a logical basis for analysis since the categories were assumed to be mutually exclusive.[2] In general, there were distinct differences in the price charged to use the respective courses on weekdays and weekends. The before and after 4:00 p.m. categories were not mutually exclusive since these categories included golfers who used the courses both on weekdays and weekends. It was believed, however, that useful results could be obtained by separating the before and after 4:00 p.m. golfers, particularly with respect to establishing future green fee policies.

Golfers were placed in the respective categories according to the time they played the courses when they were interviewed. It should be pointed out that in all probability many of the golfers who were interviewed at a given time also played the course at other times. For example, golfers who played the courses on weekends may also have played the courses on weekdays.

I. URBAN SECTOR

The hypothesis was that annual participation in golf was significantly affected by the independent variables specified in the user demand model. The user demand model subject to test was:

$$Y = a + b_1X_1 + b_2X_2 + \ldots + b_iX_i + \ldots + b_{n-1}X_{n-1}, \quad i = X_1 \ldots X_{18}$$

where

Y = annual number of visits by the individual to the golf course

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[2] Weekdays were defined as Monday through Friday and weekends included Saturday and Sunday.

X_1 = price the individual pays to use the golf course per visit

X_2 = annual income of the individual

X_3 = age of the individual

X_4 = education of the individual

Occupation of the individual:

X_5 = clerical and service

X_6 = rancher or farmer

X_7 = professional, technical

X_8 = sales

X_9 = craftsman, foreman

X_{10} = operative

X_{11} = laborer

X_{12} = management, proprietor

X_{13} = retired

X_{14} = student

X_{15} = homemaker

X_{16} = other (armed services and disabled)

Sex of the individual:

X_{17} = male

X_{18} = female

Memphis Municipal Courses

Seven hundred and seventy-one golfers interviewed on two Memphis municipal golf courses provided the information used to evaluate the factors affecting annual participation rates in golf on these courses. A summary of the empirical findings resulting from the use of the user

demand model is presented in Table XXX. These results are interpreted for each category of golfers.

All golfers. All golfers played the municipal golf courses in Memphis an average of 46 times per year at an average cost of $2.59 per visit. The mean annual gross income for all golfers was $9,586 per year. All golfers averaged 36 years of age and had an average of 14 years of education.

Regression results for the user demand model were below expectations. The multiple R was .34 and the resulting coefficient of determination, R^2, accounted for only 11 percent of the variation in the number of times the individual played golf during the year. Nevertheless, several of the variables were significantly related to annual participation rates in golf. Significant relationships within the user demand model are identified in Table XXX.

The first four continuous variables of the model, age, education, the price per visit and annual income accounted for a multiple R of .3003. Age (X_3) was the first variable to enter the model and in the final step was significant at the .01 level. The positive beta coefficient for age (.012) indicates that as age increases, the number of times an individual plays golf per year also increases. It is reasonable to expect, however, that after a certain age level is reached, participation in golf decreases. The ORRRC[3] found that the relationship between

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[3]Outdoor Recreation Resources Review Commission, Participation in Outdoor Recreation: Factors Affecting Demand Among American Adults (Washington, D.C.: U. S. Government Printing Office, ORRRC Study Report 20), p. 15.

TABLE XXX

EMPIRICAL RESULTS OF USER DEMAND MODEL USED IN THE ANALYSIS OF 771 GOLFERS SAMPLED ON TWO MUNICIPAL GOLF COURSES IN MEMPHIS, TENNESSEE, 1969

Variable[a]		All Golfers	Weekday Golfers	Weekend Golfers	Before 4:00 p.m. Golfers	After 4:00 p.m. Golfers
Number		771	469	302	687	84
Quantity	($\bar{Y}$)	46	55	40	47	51
Price per Visit	(X_1)					
mean		2.59	2.53	2.65	2.60	2.40
coefficient		-.169**	-.322***	-.123*	-.175**	-.234
t value		2.50	3.54	1.71	2.44	.92
elasticity		-.42	-.82	-.33	-.44	-.57
Annual Income	(X_2)					
mean		9,586	9,123	10,166	9,468	9,655
coefficient		.035***	-.015	.354*	.020	.092*
t value		2.75	.77	1.74	1.43	1.91
elasticity		.34	-1.39	3.60	.19	.89
Age	(X_3)					
mean		36	35	35	36	36
coefficient		.012***	.019***	.023***	.013***	-.002
t value		2.62	3.00	3.26	2.60	.17
Education	(X_4)					
mean		14	13	13	14	14
coefficient		-.048**	-.077**	-.966**	-.069***	-.066
t value		2.09	2.57	1.97	2.84	.81
Clerical	(X_5)					
coefficient		-.609**	-1.000**	-.259	-.761***	.699
t value		2.46	2.25	.41	2.90	.40
Farmer	(X_6)					
coefficient		-.069	.255	-.115	--	--
t value		1.15	.18	--	--	--
Professional	(X_7)					
coefficient		-.959***	-.654	-.293	-.982***	-.287
t value		3.69	1.49	.47	3.62	.46

TABLE XXX (continued)

Variable[a]		All Golfers	Weekday Golfers	Weekend Golfers	Before 4:00 p.m. Golfers	After 4:00 p.m. Golfers
Sales	(X_8)					
coefficient		-.585**	-.473	-.111	-.634**	-.117
t value		2.45	1.07	.18	2.44	.23
Crafts	(X_9)					
coefficient		-.534	-.539	-.223	-.650**	--
t value		1.61	1.18	.34	1.99	--
Operative	(X_{10})					
coefficient		-.504	-1.255*	.182	-.409	-3.300**
t value		1.44	1.96	.27	1.07	2.09
Laborer	(X_{11})					
coefficient		-.875**	-.828*	-.127	-.700*	--
t value		2.10	1.68	.16	1.78	--
Management	(X_{12})					
coefficient		-.793***	-.658	-.382	-.820***	-.274
t value		3.10	1.45	.62	2.99	.43
Student	(X_{14})					
coefficient		-.743***	-.503	-.212	-.632**	--
t value		2.69	1.09	.33	2.19	--
Homemaker	(X_{15})					
coefficient		-1.006**	.649	-3.837***	-.881***	-.314
t value		2.32	1.18	2.85	2.82	.64
Other	(X_{16})					
coefficient		-.088	-3.078***	-.724	-.890	--
t value		1.61	4.14	.78	1.35	--
Male	(X_{17})					
coefficient		.713***	.597	1.926***	.189	1.642*
t value		3.33	.18	3.11	.85	1.86

TABLE XXX (continued)

Variable[a]	All Golfers	Weekday Golfers	Weekend Golfers	Before 4:00 p.m. Golfers	After 4:00 p.m. Golfers
R^2	.11	.15	.18	.10	.14
S.E.E.[b]	1.31	1.36	1.2	1.35	1.50
F	6.5***	5.1***	4.1***	5.5***	1.2

*Significant at 0.10 level.
**Significant at 0.05 level.
***Significant at 0.01 level.

[a]The occupational variable, retired (X_{13}), was deleted and used as a base from which the other occupational variables were measured. The sex variable, female (X_{18}), was also deleted and used as a base to measure variations in participation by the sex of the golfer.

[b]S.E.E. = Standard error of estimate.

participation in outdoor recreation and age was progressive, with each age group participating less than the next younger age group. However, the decline in participation accelerated for the 55-64 and the 65 and over age groups.

The education variable (X_4) showed the opposite effect of age. The negative beta coefficient (-.048) implies that as the educational level increases, the frequency golf is played per year decreases. Normally, this is not what one would expect since golf is generally considered to be played more by individuals with a high education. The ORRRC found that participation in outdoor recreation was strongly related to education with one exception--men with college educations participate less than men who are high school graduates.[4] A possible explanation of the negative relationship between educational level and annual participation rates in golf is that as the educational level increases, interest and occupational demands increase and thus the time available to play golf is more limited. Another plausible explanation is that the higher educated seek a certain "status" found only by playing more of their golf at exclusive private country clubs rather than at municipal courses. Shelby County, where Memphis is located, has 10 privately owned golf courses of which five are located within a 25 mile radius of the two municipal golf courses under consideration.

The price of the golfing visit (X_1) was significant at the .05 level. The minus coefficient (-.169) is what would be normally expected.

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[4] Ibid., p. 11.

That is, as price increases, the quantity taken off the market decreases. Price elasticity was relatively inelastic, -.42, indicating a weak response of the percentage change in the quantity of golfing service purchased to a percentage change in the price of the golfing service.

The price variable was composed of green fees and the cost of transportation. Green fees for all golfers averaged $2.10 per golfer and represented 84 percent of the total cost of the golfing visit ($2.49). The average distance golfers traveled to reach the course was almost six miles requiring a traveling time of 13 minutes. The size of the golfing party for the category of all golfers averaged 3.2 persons. Transportation cost averaged $.39 per golfer, or 16 percent of the total cost of the golfing visit.

The income variable (X_2) was significantly related to annual participation rates at the .01 level. The sign of the beta coefficient (.035) was positive which supports the hypothesis that golf may be considered a normal good; that is, as income increases, the quantity of golfing services purchased (the rate of annual participation) also increases. The income elasticity value of .34 for all Memphis golfers was relatively inelastic; that is, the quantity of golfing services purchased was less than proportional to the increases in income of the golfers.

Occupation was a significant variable influencing annual participation in golf. The occupational variables, X_5 through X_{16}, were characterized by all having negative coefficients when measured from the retired occupational variable (X_{13}). This means that retired

persons played golf more times per year than golfers employed in the other occupations. This may be the result of special green fee rates offered to retired persons at all the Memphis municipal courses. Also, the Memphis courses were not physically demanding and were well-suited to play by older persons. Golfers engaged in farming (X_6), other (X_{16}), operative (X_{10}) and craft (X_9) occupations played the municipal golf course slightly less than retired individuals. Finally, considering all golfers playing the municipal courses, those golfers playing the courses the least were employed in sales (X_8), clerical (X_5), student (X_{14}), management (X_{12}), laborer (X_{11}), professional (X_7) and homemaker (X_{15}) occupations. That is, they played significantly less golf during the year than retired individuals at the 5 percent or greater level of significance.

Annual participation rates by males (X_{17}) for all Memphis golfers were greater than that of females. Variations in participation rates by males, when measured from the female variable (X_{18}), were significant at the .01 level.

In summarizing the user demand model for all Memphis golfers, it was found that 12 of the 18 variables used to explain the number of times individuals played golf was significant at either the .10, .05 or .01 levels. Also, the overall F ratio (6.5) for the model was significant at the .01 level. The standard error of estimate (1.31) was quite low and indicates a low dispersion of the Y values from the estimating equation. The resulting low R^2 (.11) was probably due to the omission of important variables from the model. Among these are the amount of

leisure time an individual has, individual preferences or personal satisfaction from playing golf, the quality of the facilities available for golfing, overcrowding and management of the course.

Weekday golfers. Four hundred and sixty-nine weekday golfers were included in the sample of Memphis municipal golfers. Weekday golfers played the municipal courses an average of 55 times per year at an average cost of $2.53 per visit. Annual income for weekday golfers averaged $9,123. The weekday golfers averaged 35 years of age and had an average of 13 years of formal education.

Regression results from the user demand model for weekday golfers were similar to that for all golfers. Again, the multiple R (.38) was quite low and the R^2 was only 15 percent. The overall F value (5.1) for the model was significant at the .01 level. Also, the dispersion of the Y values around the estimating equation was quite low as indicated by the standard error of estimate (1.36). Significant relationships resulting from the use of the model are shown in Table XXX, page 126.

Age (X_3) was the first variable to enter the model and its relationship to the number of times per year weekend golfers played golf was significant at the .01 level. The price the weekday golfers paid to play golf was also significantly related at the .01 level to annual participation rates. The price elasticity (-.82) for weekday golfers was relatively elastic. Green fee costs for weekdays on the Memphis municipal courses were $2.00 per individual. This represented 79 percent of the total cost of the golfing visit ($2.53). The average

distance traveled to the municipal courses by weekday golfers was approximately eight miles and the average travel time was 17 minutes. The golfing party averaged three persons and when total transportation costs were prorated equally, it amounted to $.53 per person, or 21 percent of total cost of the golfing visit. Weekday golfers traveled approximately two miles farther to the courses than all golfers and at a cost of $.14 more per individual.

Weekday golfers who were retired played golf more times per year than persons who were working. Those working persons employed in labor (X_{11}), clerical (X_5), operative (X_{10}) and other (X_{16}) occupations were the least likely to use the municipal courses on weekdays. They played significantly ($P \leq .05$) less golf on weekdays than golfers in the retired occupational category (X_{13}).

Weekend golfers. Three hundred and two weekend golfers were included in the sample of Memphis municipal golfers. Weekend golfers played the municipal courses an average of 40 times per year at an average cost of $2.65 per visit. Annual income of the weekend golfers averaged $10,166, which was considerably higher than that for the other categories of golfers. The weekend golfers averaged 35 years of age and had an average of 13 years of education.

Regression results of the user demand model for weekend golfers were similar to that of the other categories of golfers. The coefficient of determination, R^2, was .18 which means that only 18 percent of the variation in the number of times weekend golfers played golf during the year was accounted for by the variables included in the model. The

F value for the model was 4.1 and significant at the .01 level. The standard error of estimate was 1.2. Significant relationships in the weekend user demand model are shown in Table XXX, page 126.

As shown in Table XXX, page 126, relationships were very similar to the two previous categories. Age (X_3) and education (X_4) of the weekend golfers were both significantly related (.01 level) to annual participation rates. Income (X_2) of weekend golfers, however, differed from the category of weekday golfers. The sign of the beta coefficient changes to a positive relationship between income and annual participation (Y). Further, income elasticity was highly elastic (3.60), indicating that the participation rates of weekend golfers were very responsive to changes in income. This suggests that as incomes rise in the future, an even greater strain will be placed on the existing municipal golfing facilities during weekends.

The price per golfing visit (X_1) was significant at the .10 significance level. Price elasticity for weekend golfers was relatively inelastic at -.33, which was considerably less than the price elasticity for weekday golfers (-.82). This indicates that participation rates during weekends are not as responsive to price changes as participation rates during the weekdays.

Green fees increased from $2.00 on weekdays to $2.25 on weekends. Green fees, thus, accounted for 85 percent of the total cost of the golfing visit ($2.65) per individual. The average distance traveled to the courses by weekend golfers was approximately 6.5 miles, and

transportation cost averaged $.40 per golfer, or 15 percent of the total cost per visit. Thus, weekend golfers traveled less distance to use the municipal courses than did weekday golfers. This may be due primarily to the crowded conditions on the golf courses over the weekends which makes the courses less attractive to those golfers who live farther away.

During the weekend, it appears that golfers of all occupations played the Memphis municipal golf courses at about the same rate. The major exception, however, was those golfers employed as homemakers (X_{15}) who played significantly less (.01 level) than those golfers in the retired occupational category (X_{13}).

Before 4:00 p.m. golfers. Of the 771 golfers interviewed on the two Memphis municipal courses, 687, or 89 percent, played before 4:00 p.m. These golfers averaged playing the municipal courses 47 times per year at an average cost per visit of $2.50. The annual income of these golfers averaged $9,468. The before 4:00 p.m. golfers averaged 36 years of age and had an average of 14 years of formal education.

The variables included in the user demand model failed to explain a significant amount of the variation in annual participation rates for the before 4:00 p.m. category of golfers (R^2 = 10). Eleven of the 18 variables were significantly related at the .10, .05 or .01 levels to annual participation rates. The overall F value of 5.5 for the model was highly significant at the .01 level. Variables significantly influencing annual participation of before 4:00 p.m. golfers are shown in Table XXX, page 126.

Since most of the golfers sampled played before 4:00 p.m., the results of the model parallel that for the category of all golfers. Age (X_3) and education (X_4) were the first variables to enter the model and in the final step were significant at the .01 level.

The price (X_1) of the golfing visit for those who played before 4:00 p.m. was significant at the .05 level. The average cost of green fees was $2.08, which accounted for 83 percent of the total cost of the golfing visit ($2.50). The average cost of transportation per golfer was $.42, or 17 percent of the price of the golfing visit. The average distance traveled per golfing party was approximately six miles and the time required to cover this distance averaged a little over 15 minutes. The price elasticity (-.44) was relatively inelastic.

Occupation was a significant variable influencing annual participation rates of before 4:00 p.m. golfers. Golfers in the retired occupational category (X_{13}) played golf more times per year than golfers in the other occupational groups. The next major users of the courses before 4:00 p.m. were those golfers who were employed as operative workers (X_{10}). Students (X_{14}), salesmen (X_8) and those individuals employed in crafts (X_9) played significantly less golf than retired individuals (.05 level). The occupational variables clerical (X_{11}), management (X_{12}), homemaker (X_{15}) and professional (X_7) were significantly related to annual participation rates at the .01 significance level.

After 4:00 p.m. golfers. Eighty-four golfers were interviewed after 4:00 p.m. on the two municipal courses in Memphis. These golfers

played the courses an average of 51 times per year at an average cost of $2.40 per visit. Annual income of the after 4:00 p.m. golfers was $9,655 and higher than the income of the before 4:00 p.m. golfers. This suggests that free time may be more important than the cost of playing golf in determining when one plays. The after 4:00 p.m. golfers averaged 36 years of age and had an average of 14 years of formal education.

Only 12 of the 18 variables entered the final model. (Table XXX, page 126.) This was the only model among the five categories of golfers in which the F ratio (F = 1.2) was not significant. The coefficient of determination (R^2 = .14) again failed to explain a significant variation in annual participation. As the model indicates in Table XXX, page 126, only three variables were significant.

Income (X_2) of the after 4:00 p.m. golfers was significantly related to the number of times these golfers played golf per year at the .10 level. The income elasticity value of .89 was more elastic than it was for the before 4:00 p.m. golfer category. This implies that the frequency of golf played on municipal courses in Memphis is more responsive to changes in income for the after 4:00 p.m. golfers than it is for the before 4:00 p.m. golfers.

Golfers in the retired (X_{13}), sales (X_8), management (X_{12}), professional (X_7) and homemaker (X_{15}) occupational categories played golf more often during the year after 4:00 p.m. than golfers in the operative category. However, the operative occupational category (X_{10}) was the only category significantly different from the retired category (X_{13}).

Green fees for all Memphis municipal courses did not change after 4:00 p.m. The average green fee paid was $2.05 per individual. Thus, the green fees paid were in line with those paid by the other four categories of golfers. However, the average distance traveled by the after 4:00 p.m. golfers was about five miles at an average cost of $.35 per individual. Thus, the after 4:00 p.m. golfers traveled less distance to the golf course than golfers in the other four categories. It is reasonable to expect that most of the after 4:00 p.m. golfers lived in the surrounding neighborhood.

Nashville Municipal Courses

Six hundred and fourteen golfers interviewed on two Nashville municipal golf courses provided the information used to evaluate the factors affecting annual participation rates in golf on these courses. A summary of the empirical findings resulting from the use of the user demand model is presented in Table XXXI. These results are interpreted for each category of golfers.

All golfers. All golfers played the municipal golf courses in Nashville an average of 53 times per year at an average cost of $2.59 per visit. The mean annual income of all golfers was $9,137 per year. All golfers averaged 36 years of age and had an average of 14 years of education.

The user demand model failed to explain a significant amount of the variation in annual participation rates for all golfers in Nashville. The results were similar to those obtained for all golfers in Memphis.

TABLE XXXI

EMPIRICAL RESULTS OF USER DEMAND MODEL USED IN THE ANALYSIS OF 614 GOLFERS SAMPLED ON TWO MUNICIPAL GOLF COURSES IN NASHVILLE, TENNESSEE, 1969

Variable[a]		All Golfers	Weekday Golfers	Weekend Golfers	Before 4:00 p.m. Golfers	After 4:00 p.m. Golfers
Number		614	362	252	536	78
Quantity	($\bar{Y}$)	53	50	48	53	32
Price per Visit	(X_1)					
mean		2.59	2.71	2.41	2.67	2.46
coefficient		-.329***	-.193**	-.170	-.342***	.686**
t value		4.47	2.04	.87	4.54	2.11
elasticity		-.85	-.52	-.41	-.91	1.69
Annual Income	(X_2)					
mean		9,137	9,127	9,218	9,169	8,910
coefficient		-.032*	-.007	.083	-.025	.017
t value		1.94	.28	.38	1.43	.47
elasticity		-.30	-2.55	3.50	-.23	.15
Age	(X_3)					
mean		36	38	35	36	33
coefficient		-.022***	.016**	.013*	.025***	.014
t value		4.43	2.19	1.69	4.71	1.04
Education	(X_4)					
mean		14	13	14	13	14
coefficient		-.072***	-.129***	-.0004	-.082***	.218***
t value		2.62	3.31	.01	2.65	2.88
Clerical	(X_5)					
coefficient		-.762***	-1.055***	-.949***	-.838***	-2.139
t value		3.77	3.12	2.77	3.85	1.56
Farmer	(X_6)					
coefficient		-	-	-	-	-
t value		-	-	-	-	-

TABLE XXXI (continued)

Variable[a]		All Golfers	Weekday Golfers	Weekend Golfers	Before 4:00 p.m. Golfers	After 4:00 p.m. Golfers
Professional	(X_7)					
coefficient		-.287	-.655*	-1.156***	-.355*	-2.871**
t value		1.50	1.89	3.11	1.65	2.00
Sales	(X_8)					
coefficient		-.313	-.327	-.809**	-	-2.729**
t value		.87	.88	2.55	-	2.06
Crafts	(X_9)					
coefficient		-.243	-.653*	-	-.190	-3.320**
t value		.98	1.76	-	.71	2.03
Operative	(X_{10})					
coefficient		-.694	-.360	-	-.997*	-1.417
t value		1.48	.58	-	1.88	.82
Laborer	(X_{11})					
coefficient		.433	-.177	-1.228*	-.483	-2.591*
t value		1.40	.37	1.91	1.43	1.73
Management	(X_{12})					
coefficient		-.182	-.636	-.526	-.261	2.708*
t value		.83	1.53	1.49	1.06	1.91
Student	(X_{14})					
coefficient		-2.675***	-.937**	-1.086***	.217	-3.445**
t value		4.11	2.41	3.11	.91	2.43
Homemaker	(X_{15})					
coefficient		-.236	-	-.981***	-2.829***	-3.683**
t value		1.12	-	2.72	4.27	2.44
Other	(X_{16})					
coefficient		-	-1.475	-	-	-2.622
t value		-	1.26	-	-	1.65
Male	(X_{17})					
coefficient		.138	.322	.778***	.144	1.138*
t value		1.34	1.13	2.80	.56	1.91

TABLE XXXI (continued)

Variable[a]	All Golfers	Weekday Golfers	Weekend Golfers	Before 4:00 p.m. Golfers	After 4:00 p.m. Golfers
R^2	.14	.15	.14	.18	.39
S.E.E.[b]	1.4	1.5	1.3	1.4	1.1
F	8.4***	4.7***	3.6***	10.2***	2.9***

*Significant at 0.10 level.
**Significant at 0.05 level.
***Significant at 0.01 level.

[a]The occupational variable, retired (X_{13}), was deleted and used as a base from which the other occupational variables were measured. The sex variable, female (X_{18}), was also deleted and used as a base to measure variations in participation by the sex of the golfer.

[b]S.E.E. = Standard error of estimate.

The multiple R was .38, and the coefficient of determination, R^2, was only 14 percent. However, the overall F ratio for the model was 8.4 which was significant at the .01 level. This provides some measure of reliability in the model since the significant F value implies that at least one variable in the model significantly influences annual participation in golf. Further, the standard error of estimate of 1.4 indicates a relatively small dispersion of observations around the estimating equation.

Significant relationships resulting from the use of the model selected are identified in Table XXXI, page 139.

Age (X_3) was significant at the .01 level and showed a positive relationship to annual participation in golf (Y). That is, with a unit increase in age, the rate of annual participation in golf increases by the magnitude of the beta coefficient (.022).

Price (X_1) was negatively related to participation. This indicates that as price decreases, annual participation rates in golf decrease. Participation rates were not very responsive to price changes, however, as indicated by the inelastic price elasticity of -.85.

Unlike in Memphis, Nashville municipal golf courses charged a uniform green fee of $2.00 per individual at all times for all categories of golfers. A breakdown of the price variable (X_1) for the category of all golfers shows that the green fee accounted for 77 percent of the average price of $2.59 per golfing visit. All golfers averaged traveling 7.5 miles to the golf course and transportation costs averaged $.59 per individual, or 23 percent of the average price per golfing visit.

The relationship between education and annual participation in golf for all golfers in Nashville was negative. Similar results were obtained for the same category of golfers in Memphis. It appears that although education significantly affects participation in golf, its effect is diluted by other interests and occupational demands as the educational level increases.

Income (X_2) was significantly related to participation in golf at the .10 level. Its negative relationship suggests that golf may be considered an inferior good. Thus, with increases in income, consumers will turn their attention to other goods and services. It is quite likely, for example, that once a consumer's income reaches a certain level he may join a country club to play golf. That is, the golfing services and privileges at a country club may differ widely from those offered on municipal courses and may be considered by the consumer as two different products or services. Income elasticity was inelastic at -.30 indicating that the golfing services purchased by all golfers in Nashville are not very responsive to changes in income.

Golfers that were employed as laborers (X_{11}) played more often during the year than golfers in any of the other occupational categories. The relationship, however, between the labor occupational variable and the retired category was not significant. Golfers that were retired were the second highest users of the courses on an annual basis. As in Memphis, the Nashville Park and Recreation Department offered special green fees for retired individuals. All the other occupational variables entered the model with negative beta coefficients which indicates they

fell below the retired occupation variable on the Y axis. Clerical workers and students were the only occupational category of golfers to play significantly less golf (.01 level) than retired individuals.

The failure of the user demand model to explain variations in annual participation rates of golfers in Nashville are probably due to variables not included in the model. For instance, leisure time for urban golfers apparently is a factor influencing participation rates. Furthermore, the existence in Nashville of six privately owned golf courses within a radius of 25 miles of the municipal courses studied is most likely a major factor influencing participation rates.

Weekday golfers. Of the 614 golfers interviewed on the two Nashville municipal golf courses, 362 played during the weekdays. These weekday golfers averaged playing 50 times per year at an average cost of $2.71 per visit. Annual income for weekday golfers averaged $9,127 per year. Their average age was 38 years and education was equivalent to the sophomore level in college.

The coefficient of determination, R^2, for the overall model was only 15 percent. The F ratio of 4.7, however, was significant at the .01 level. Further, as shown in Table XXXI, page 139, seven of the 18 variables significantly influenced the annual participation of weekend golfers.

Age (X_3) and education (X_4) were significantly related to participation rates at the .05 and .01 level, respectively. Their impact upon participation was very similar to the impact of those variables for the all golfers category.

The price variable (X_1) exhibited a negative relationship with annual participation and was significant at the .05 level. Price elasticity was relatively elastic at -.52 indicating the participation rates of weekday golfers using Nashville municipal courses were more responsive to price changes than the participation rates of weekend golfers.

The composition of the price variable for weekday golfers was quite different from the category of all golfers. Weekday golfers traveled just over 10 miles to play golf which was considerably farther than the average distance traveled by all golfers. The average cost of transportation was $.71 per individual, or 29 percent of the average price of $2.71. The proximity of the interstate highway system to the courses studied was probably a major factor related to the distance traveled by weekday golfers. Further, it is reasonable to expect that weekday golfers will travel farther than weekend golfers because of the overcrowded conditions on the courses on weekends.[5]

All occupational variables entered the user demand model with negative coefficients. Thus, retired golfers (X_{13}) played more golf on weekdays during the year than golfers in any of the other occupational categories. Those golfers employed as laborers (X_{11}) and salesmen (X_8) were the second highest users of the courses on weekends during the year but did not exhibit a significant relationship from those golfers in the retired occupational category (X_{13}). Golfers in the

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[5] In sampling the golfers playing on weekends, as many as 40 to 50 golfers were counted waiting to tee off on the first tee at one of the Nashville municipal courses. This meant a two to three hour wait before some of the golfers could tee off and this, coupled with slow play, meant that anywhere from five to seven hours might be spent at the course.

crafts (X_9) and professional (X_7) occupational categories played significantly less golf (.10 level) than golfers in the retired occupational category. The clerical occupational variable (X_5) was significantly different at the .01 level from the retired occupational group. Student golfers (X_{14}) played significantly less (.05 level) golf during the year than retired golfers.

Weekend golfers. Two hundred and fifty-two weekend golfers were included in the sample of Nashville municipal golfers. On the average, weekend golfers used the courses 48 times per year at an average individual cost per visit of $2.41. Annual income, averaging $9,218, was slightly higher than the income of the weekday golfers. Weekend golfers averaged 35 years of age and had an average of 14 years of education.

The user demand model for weekend golfers was characterized by the fact that neither price, income nor education significantly influenced annual participation in golf. This was the only category of golfers in which neither of these three variables exerted an influence. Table XXXI, page 139, identifies all of the variables that entered the model for weekend golfers and resulting significant relationships.

Of significance is the observation that weekend golfers traveled less than half the distance to the golf course than did weekday golfers. Since the green fee did not change for weekend golfers, emphasis is focused on the distance traveled. Obviously, weekend golfers did not consider travel a major cost. On the other hand, cost of transportation was apparently a factor for weekday golfers since price of the golfing visit was significantly related to participation rates at the .05 level.

The overall F ratio of 3.6 for the model was significant at the .01 level. The coefficient of determination, however, explained only 14 percent of the variation in participation rates. This was almost identical to the category of weekday golfers, as shown in Table XXXI, page 139.

Occupation exerted a major influence on annual participation rates of weekend golfers on the Nashville Municipal Golf courses. Annual participation rates were the greatest for those weekend golfers in the retired occupational category (X_{13}). Weekend golfers employed as managers (X_{12}) were the second highest users of the courses on an annual basis. The relationship, however, between the managerial occupational variable and the retired occupational variable was not significant. Weekend golfers employed as salesmen played significantly less (.05 level) golf than retired individuals. The occupational variables clerical (X_5), homemaker (X_{15}), student (X_{14}) and professional (X_7) showed a significant relationship with annual participation in golf at the .01 level.

Before 4:00 p.m. golfers. Five hundred and thirty-six of the golfers sampled in Nashville played before 4:00 p.m. These golfers averaged playing golf 53 times per year on the municipal courses and the average cost per visit was $2.67. Their average annual income was $9,169 per year. The before 4:00 p.m. golfers averaged 36 years of age and had an average of 13 years of education.

Because the majority of golfers were sampled before 4:00 p.m., the results of this model are very similar to the results of the model

for the all golfers category (Table XXXI, page 139). Age (X_3) and education (X_4) were significant in explaining participation rates at the .01 level for both categories. A major difference, however, is that income (X_2) did not significantly influence the annual participation rates of the before 4:00 p.m. golfers but significantly influenced the participation rates of all golfers. Both categories, however, exhibited negative relationships between income and participation, thus implying that participation rates decrease as income increases.

Price (X_1) per golfing visit was significantly related to participation rates at the .01 level. However, it was relatively inelastic, -.91, indicating that a percentage change in the annual number of days golfed was less than proportional to a corresponding percentage change in price. Thus, with a small increase in the green fee paid or an increase in cost of transportation, there would be no significant change in the annual number of days golfed by the before 4:00 p.m. golfers. The green fee accounted for 75 percent of the mean price of $2.69 per golfing visit and the cost of transportation, 25 percent.

Student golfers (X_{14}) played more days of golf before 4:00 p.m. during the year than golfers in any of the other occupational categories. However, the relationship between the student occupational variable and the retired occupational variable (X_{13}) was not significant. Retired golfers (X_{13}) were the second highest users of the golf courses before 4:00 p.m. during the year. The professional (X_7) and operative (X_{10}) occupational categories played golf significantly less than the retired

category at the .10 significance level. Golfers in the clerical (X_5) and homemaker (X_{15}) occupational categories played significantly less (.01 level) golf before 4:00 p.m. during the year than retired golfers.

After 4:00 p.m. golfers. Of the 614 golfers sampled in Nashville, 78 played golf after 4:00 p.m. The annual participation rates of the after 4:00 p.m. golfers were considerably less than the participation rates of the before 4:00 p.m. golfers. The price paid per visit by the after 4:00 p.m. golfers was also lower than the price paid per visit by the before 4:00 p.m. golfers. Average annual income of the after 4:00 p.m. golfers was $9,910 per year. The average age of 33 years for the after 4:00 p.m. golfers was the youngest among the four golfer categories. The average years of formal education for the after 4:00 p.m. golfers was 14 years.

Results of the user demand model for the after 4:00 p.m. golfers were better than the results from using the model for the other categories of golfers (Table XXXI, page 139). The R^2 was .39, which means that the independent variables explained 39 percent of the variations in annual participation rates for the after 4:00 p.m. golfers. Further, the overall F ratio of 2.9 was significant at the .01 level.

The after 4:00 p.m. golfers was the only category of golfers in which age was not a significant variable in explaining annual participation rates in golf. Education was a significant variable at the .01 level and exhibited a positive relationship to participation. This indicates that as the educational level of the golfers increases one

unit, the number of annual golfing days increases by the amount of the education beta coefficient (.218).

The after 4:00 p.m. golfers was the only category of golfers in which price was positively associated with annual participation rates. Therefore an unexpected result occurred from the analysis of the after 4:00 p.m. golfers when it was found that the price variable (X_1) had a positive sign. This is contrary to what was expected since an increase in the price of a service generally results in a decrease in the quantities purchased. In this case, the quantity of the golfing services purchased was responsive to a price change in an upward direction as indicated by the price elasticity of 1.69. It is difficult to explain this result. Perhaps, if an increase in green fee is accompanied by an improvement in the quality of the facilities, golfers will play more at higher prices. Or it may be that if traveling conditions are improved or made more scenic, golfers will travel farther at a higher cost to play golf. For example, the presence of interstate highways may make it more feasible for those after 4:00 p.m. golfers to travel to the golf courses quicker but at a higher cost.

Occupations exerted a significant influence on participation rates of the after 4:00 p.m. golfers. Seven of the 13 occupational variables were significant in explaining participant rates. Golfers employed in the managerial occupational category (X_{12}) played significantly (.10 level) more days of golf during the year after 4:00 p.m. than golfers in any of the other occupational categories. The second highest users of the courses after 4:00 p.m. were those golfers in the

retired category (X_{13}). Golfers employed as laborers (X_{11}), salesmen (X_8), professionals (X_7), students (X_{14}) and homemakers (X_{15}) played significantly (.01 or greater level) less golf than golfers who were retired.

Knoxville Municipal Course

Two hundred and fifty-four golfers interviewed on the Knoxville municipal golf course provided the information used to evaluate the factors affecting annual participation rates in golf on this course. A summary of the empirical finding resulting from the use of the user demand model is presented in Table XXXII. These results are interpreted for each category of golfers.

All golfers. All golfers in the Knoxville sample averaged playing the municipal golf course 53 times per year at an average of $3.23 per visit. Their mean annual gross income was $8,707 per year which was about $1,000 less than for all golfers in Memphis and Nashville. All golfers averaged 36 years of age and had an average of 13 years of formal education.

Regression results from the user demand model for all golfers in Knoxville were below expectations and paralleled those of the user demand model for the two previous cities, Memphis and Nashville. The multiple R was .41, and the coefficient of determination, R^2, accounted for only 17 percent of the variation in annual participation rates. Apparently important variables influencing participation rates were not included in the model.

TABLE XXXII

EMPIRICAL RESULTS OF USER DEMAND MODEL USED IN THE ANALYSIS OF 254 GOLFERS SAMPLED ON THE MUNICIPAL GOLF COURSE IN KNOXVILLE, TENNESSEE, 1969

Variable[a]		All Golfers	Weekday Golfers	Weekend Golfers	Before 4:00 p.m. Golfers	After 4:00 p.m. Golfers
Number		254	85	169	233	21
Quantity	($\bar{Y}$)	53	60	47	57	40
Price per Visit	(X_1)					
mean		3.23	2.87	3.35	3.17	2.59
coefficient		-.193	-.469**	-.911**	-.317***	-.225
t value		1.38	2.38	1.99	2.68	.58
elasticity		-.62	-1.35	-3.05	-1.00	-.59
Annual Income	(X_2)					
mean		8,707	8,659	9,005	8,566	11,143
coefficient		.026	-.025	.059*	.022	-.039
t value		.87	.62	1.76	.78	1.03
elasticity		.21	-.22	.53	.19	-.45
Age	(X_3)					
mean		36	39	37	37	38
coefficient		.009	.045***	.007	.002	-.021
t value		.94	3.56	.67	.21	1.16
Education	(X_4)					
mean		13	12	14	12	15
coefficient		-.184***	-.029	-.093	-.166***	-.205**
t value		4.24	.39	1.51	4.01	2.82
Clerical	(X_5)					
coefficient		-.960**	-	-.062	-.995**	-1.103**
t value		1.98	-	.40	2.14	2.15
Farmer	(X_6)					
coefficient		-	-	-1.185	-	-.685
t value		-	-	.68	-	.61

TABLE XXXII (continued)

Variable[a]		All Golfers	Weekday Golfers	Weekend Golfers	Before 4:00 p.m. Golfers	After 4:00 p.m. Golfers
Professional	(X_7)					
coefficient		-.756	-.727	-.680	-.914*	-
t value		1.55	.14	1.22	1.96	-
Sales	(X_8)					
coefficient		-.297	.538	-.449	-.452	-
t value		.54	1.20	.82	.88	-
Crafts	(X_9)					
coefficient		-.849*	-	-.337	-.998**	-.269
t value		1.73	-	.29	2.12	.45
Operative	(X_{10})					
coefficient		-.375	.589	-1.828*	-.538	-
t value		.60	.96	1.95	.93	-
Laborer	(X_{11})					
coefficient		-.495	-1.447*	-.888	-.550	-
t value		.80	1.79	.79	.94	-
Management	(X_{12})					
coefficient		-1.071*	.317	-.882	-.769	-.082
t value		1.81	.66	1.50	1.41	.10
Student	(X_{14})					
coefficient		-.936	.549	.108	-1.260**	-1.08*
t value		1.48	1.08	.19	2.29	1.76
Homemaker	(X_{15})					
coefficient		-.646	-.123	-.385	-1.198	-
t value		.87	.18	.62	1.49	-
Other	(X_{16})					
coefficient		-.985	-1.295	-	-.128	-
t value		.97	1.01	-	.12	-
Male	(X_{17})[b]					
coefficient		.401	.627	-	.215	-
t value		.86	1.20	-	.45	-

TABLE XXXII (continued)

Variable[a]	All Golfers	Weekday Golfers	Weekend Golfers	Before 4:00 p.m. Golfers	After 4:00 p.m. Golfers
R^2	.17	.33	.11	.19	.84
S.E.E.[b]	1.52	1.24	1.46	1.41	.55
F	3.4***	3.0***	1.49	3.7***	6.2***

*Significant at 0.10 level.

**Significant at 0.05 level.

***Significant at 0.01 level.

[a]The occupational variable, retired (X_{13}), was deleted and used as a base from which the other occupational variables were measured. The sex variable, female (X_{18}) was also deleted and used as a base to measure variations in participation by the sex of the golfer.

[b]S.E.E. = Standard error of estimate.

One factor influencing annual participation rates not mentioned previously, and of particular relevance to Knoxville, is the absence of golf courses that are open to the general public. Unlike Memphis and Nashville, Knoxville has only one municipal golf course. Seven private and three semiprivate golf courses are located within a 25 mile radius of the municipal course. The absence of public courses within the immediate metropolitan area has resulted in frequent crowded conditions on the municipal course and thus created a strain on existing facilities. This suggests that the user model employed to explain participation rates for the Knoxville municipal course is influenced by supply variables to a larger extent than the models used to explain participation rates of golfers in Memphis and Nashville.

Although the explanatory variables failed to explain a significant amount of variation in annual participation rates, the overall F ratio of 3.4 for the model for all golfers was significant at the .01 level. This implies that at least one of the independent variables in the model significantly influenced annual participation (Y). Significant relationships for the model are identified in Table XXXII, page 152.

Education (X_4) was the first variable to enter the model and in the final step was significant at the .01 level. The relationship between education and the number of annual golfing days was negative, indicating that as the level of education increases, the frequency of participation in golf decreases. This was also characteristic of all golfers sampled in Memphis and Nashville.

Golfers in the retired occupational category (X_{13}) played golf

more frequently during the year than individuals in the other occupational categories. Knoxville, like Memphis and Nashville, offered special rates to retired individuals who played golf, which probably accounts for the heavy use of the municipal courses by these individuals. Golfers in the sales occupational category (X_8) were the second highest users of the courses during the year. The relationship, however, between the sales occupational variable and the retired occupational variable was not significant. Golfers in the clerical occupation (X_5) played significantly less (.05 level) golf than retired individuals; whereas, the managerial (X_{12}) and craft (X_9) occupations were significantly different at the .10 significance level.

Although price of the golfing visit (X_1) did not significantly influence participation, its composition is of interest. The green fee paid by all golfers averaged $2.71, or 84 percent of the mean price of $3.23 per golfing visit. Average distance traveled to the municipal course was slightly less than seven miles and the cost averaged $.52 per individual, or 16 percent of the mean price of the golfing visit.

Weekday golfers. Eighty-five weekday golfers were interviewed on the Knoxville municipal golf course. These golfers averaged playing the course 60 times a year which was considerably higher than the participation rates for the weekend golfers (Table XXXII, page 152). This suggests that the lack of public golfing facilities in Knoxville forces the golfing public to play more frequently on weekdays than on weekends when the course is more likely to be crowded. The average price per visit for weekday golfers was $2.87. The mean annual income

for weekday golfers was $8,659 which was a little over $300 less than the income of weekend golfers. Weekday golfers averaged 39 years of age and had an average of 12 years of education.

The multiple R resulting from the user demand model was .57, and the explanatory variables accounted for 33 percent (R^2) of the variation in annual participation rates. The F ratio (3.0) for the weekday model was significant at the .01 level. Significant relationships are identified in Table XXXII, page 152.

Age (X_3) was the most significant variable (.01 level) in explaining participant rates for weekday golfers. It is interesting to note that age, however, was not significant for weekend golfers (Table XXXII, page 152). Apparently the weekdays offered those individuals with a higher age and a lower income a better opportunity to play the municipal course more often.

Part of the above explanation may be due to differences in price since the green fee cost was lower on weekdays than on weekends. Weekday green fee charges were $2.50 per individual, or 87 percent of the average price of $2.87 per golfing visit. The average distance traveled to the golf course was 5.3 miles and individual transportation cost averaged $.37, or 13 percent of the average price of the golfing visit. Participation rates of weekday golfers were thus quite responsive to the price of the golfing visit.[6] This is indicated by the elastic price

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[6]In personal conversations with managerial personnel at the Knoxville municipal golf course it was indicated that the slight increase in green fees over the past few years has not noticably reduced play. One may conclude therefore, that the cost of transportation to the golf

price elasticity value of -1.35, which indicates that a 1 percent decrease in price will result in an increase in participation of 1.35 percent.

Golfers in the operative (X_{10}), student (X_{14}), sales (X_8) and managerial (X_{12}) occupational categories played more frequently during the year than golfers in the other occupational categories, but their participation rates were not significantly higher than those of the retired (X_{13}) occupational category. Golfers employed as laborers (X_{11}) played the golf course significantly (.10 level) less than retired golfers.

Weekend golfers. One hundred and sixty-nine golfers were included in the sample of Knoxville municipal golfers. Weekend golfers played the municipal course an average of 47 times per year at an average cost of $3.35 per visit. Annual income for weekend golfers averaged $9,005. The weekday golfers averaged 37 years of age and had an average of 14 years of formal education.

Only three variables were found to be significant in the final model (Table XXXII, page 152). The multiple R was .34 and R^2 was only 11 percent.

Price (X_1) of the golfing visit was the first variable to enter the model and was significant at the .05 level in the final step.

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course is the more relevant component of the price variable, ceteris paribus. This may be of particular significance since population growth has become concentrated in the outlying suburban areas. Most of the courses sampled were located near the inner core of the city.

Price elasticity was highly elastic (-3.05) indicating that weekend golfers were much more responsive to a price change in the golfing visit than were weekday golfers. That is, with a decrease in price, participation rates of weekend golfers will increase relatively more than the participation rates of weekday golfers. This is reasonable to expect since the green fee increased to an average of $3.00 per individual, or 90 percent of the average price of $3.25 per golfing visit. Greater participation during the weekends would be expected because of the increased availability of leisure time. Distance traveled to the golf course by weekend golfers did not vary much from that of weekday golfers. Cost of transportation for weekend golfers averaged $.35 per individual, or 10 percent of average price of the golfing visit.

Income (X_2) was found to be a factor influencing annual participation in golf on the Knoxville course only for the weekend category. While the relationship between income and participation was negative for weekday golfers, it was positive for weekend golfers. This suggests that weekend golfers consider golfing services more of a superior good or a more appropriate use of their leisure time than do weekday golfers. The income elasticity value of .53 for weekend golfers was relatively elastic.

Students (X_{14}) played more frequently on weekends than any of the other occupational categories. The relationship, however, between the student and retired occupational variable was not significant. Retired golfers were the second highest users of the golf course on weekends. However, golfers in the operative occupation (X_{10}) were

the only golfers to play significantly (.10 level) less golf on weekends than retired golfers.

Before 4:00 p.m. golfers. A total of 233 golfers were interviewed before 4:00 p.m. on the Knoxville municipal golf course. They averaged playing the course 57 times per year at an average cost per visit of $3.17. Annual income of these golfers was $8,566 per year. The before 4:00 p.m. golfers averaged 37 years of age and had an average of 12 years of education.

The user demand model explained only .19 percent (R^2) of the variation in annual participation rates. However, the overall F ratio of the model was significant at the .01 level. Those variables that significantly influenced annual participation (Y) are shown in Table XXXII, page 152.

Education (X_4) was significant at the .01 level. However, the relationship between education and annual participation was negative. It may be that the presence of a large number of high schools and the nearby University of Tennessee was a major factor influencing the negative relationships. Students (X_{14}) were significant at the .05 level. However, students may be hampered somewhat in their participation by a number of factors such as lack of income and transportation. Further, as the education level increases, interests may be diverted to other pursuits.

Price elasticity was unitary, indicating that a unit change in price would be accompanied by a proportional change in annual participation on the golf course. Green fees charged per individual averaged

$2.61, or 82 percent of the mean price of $3.17. Cost of transportation averaged $.56 per individual, or 18 percent of the mean price per visit.

Retired golfers (X_{13}) played more days of golf before 4:00 p.m. during the year than golfers in any of the other occupational categories. Those golfers engaged in professional (X_7) played significantly (.10 level) less than retired golfers. The clerical (X_5), craft (X_9) and student (X_{14}) occupational variables were significantly different from the retired occupational variable at the .05 significance level.

After 4:00 p.m. golfers. A total of 21 golfers were sampled after 4:00 p.m. on the Knoxville municipal golf course.[7] On the average, they used the course 40 times per year at an average cost of $2.88 per visit. Their annual income was the highest among the five categories, at $11,143 (Table XXXII, page 152). The mean age of the after 4:00 p.m. golfers was 38 years, and the average number of years of education was 15.

The user demand model accounted for a multiple R of .91 and an R^2 of .84 percent. Further, the overall F ratio for the model was significant at the .01 level. Although the results for the model were the best among the five categories, it is well to note that this may have been the result of the small number of observations.

Education (X_4) was the only significant continuous variable (.05 level). However, it was negatively associated with the annual

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[7]Rain interrupted interviewing in the late afternoon for four of the seven days spent on the Knoxville municipal course.

number of golfing days. That is, with a one unit increase in education the annual number of golfing visits will decrease by the beta coefficient (-.205) of education.

Occupation appeared to have little influence on annual participation rates of after 4:00 p.m. golfers on the Knoxville municipal golf course. Golfers in the retired occupational category (X_{13}) were the major users of the course after 4:00 p.m., followed by golfers in the managerial (X_{12}) and crafts (X_9) occupational categories.

Johnson City Municipal Golf Course

One hundred and fifty-seven golfers interviewed on the Johnson City municipal golf course provided the information used to evaluate the factors affecting annual participation rates on this golf course. A summary of the empirical findings resulting from the use of the user demand model is presented in Table XXXIII. These results are interpreted for each category of golfers.

All golfers. All golfers played the Johnson City municipal golf course an average of 59 times per year at an average cost of $2.96 per visit. The mean annual gross income for all golfers was $8,501 per year. All golfers averaged 36 years of age and had an average of 13 years of education.

The multiple R for the user demand model was .54, and R^2 was .29 percent. The F ratio was significant at the .01 level. The standard error of estimate was quite low at 1.38, which indicates a low dispersion of observations around the estimating equation. Only three variables were significant in the final model (Table XXXIII).

TABLE XXXIII

EMPIRICAL RESULTS OF USER DEMAND MODEL USED IN THE ANALYSIS OF 157 GOLFERS SAMPLED ON THE MUNICIPAL GOLF COURSE IN JOHNSON CITY, TENNESSEE, 1969

Variable[a]		All Golfers	Weekday Golfers	Weekend Golfers	Before 4:00 p.m. Golfers	After 4:00 p.m. Golfers
Number		157	105	52	122	35
Quantity	($\bar{Y}$)	59	54	62	57	49
Price per Visit	(X_1)					
mean		2.96	2.83	3.33	3.02	2.55
coefficient		-.404***	-.338***	-.838**	-.418***	-1.387**
t value		4.22	2.99	2.10	3.84	2.34
elasticity		-1.20	-.96	-2.79	-1.26	-3.54
Annual Income	(X_2)					
mean		8,501	8,076	9,442	8,450	11,028
coefficient		-.520	-.025	.069	-.016*	.019
t value		1.47	.72	1.30	1.67	.33
elasticity		-4.36	-.20	.65	-.14	.21
Age	(X_3)					
mean		36	33	38	36	37
coefficient		.553***	.048***	.0005	.060***	.008
t value		4.91	3.16	.24	5.07	.42
Education	(X_4)					
mean		13	14	14	13	14
coefficient		-.682	-.133	-.077	-.037	-.074
t value		1.17	1.81*	.70	.51	.74
Clerical	(X_5)					
coefficient		--	--	-.503	-.301	-.732
t value		--	--	.49	.76	1.19
Farmer	(X_6)					
coefficient		--	--	--	--	--
t value		--	--	--	--	--

TABLE XXXIII (continued)

Variable[a]		All Golfers	Weekday Golfers	Weekend Golfers	Before 4:00 p.m. Golfers	After 4:00 p.m. Golfers
Professional	(X_7)					
coefficient		--	.181	-1.702	-.206	.325
t value		--	.39	1.42	.47	.61
Sales	(X_8)					
coefficient		.122	-.249	-.133	--	--
t value		.31	.42	.13	--	--
Crafts	(X_9)					
coefficient		-.299	-.928	-.639	-.679	--
t value		.73	1.60	.59	1.42	--
Operative	(X_{10})					
coefficient		.417	-.484	.525	.334	-1.430
t value		.32	.46	.42	.44	1.27
Laborer	(X_{11})					
coefficient		-.310	--	-1.035	-.789	-1.516*
t value		.53	--	.63	.90	1.76
Management	(X_{12})					
coefficient		.543*	-.977*	-1.425	.376	--
t value		1.89	1.78	1.33	.85	--
Student	(X_{14})					
coefficient		.326	.410	-8.25	--	-3.576***
t value		.85	.68	.69	--	3.09
Homemaker	(X_{15})					
coefficient		-.468	-1.172	--	-.248	--
t value		.72	1.02	--	.36	--
Other	(X_{16})					
coefficient		-.440	-.215	--	-.611	--
t value		.31	1.20	--	.42	--
Male	(X_{17})					
coefficient		.177	.350	--	.172	--
t value		.37	.54	--	.34	--

TABLE XXXIII (continued)

Variable[a]	All Golfers	Weekday Golfers	Weekend Golfers	Before 4:00 p.m. Golfers	After 4:00 p.m. Golfers
R^2	.29	.33	.42	.34	.49
S.E.E.[b]	1.38	1.37	1.23	1.40	1.03
F	4.8***	3.8***	2.4***	4.6***	2.7***

*Significant at 0.10 level.

**Significant at 0.05 level.

***Significant at 0.01 level.

[a]The occupational variable, retired (X_{13}), was deleted and used as a base from which the other occupational variables were measured. The sex variable, female (X_{18}), was also deleted and used as a base to measure variations in participation by the sex of the golfer.

[b]S.E.E. = Standard error of estimate.

CRANES CREST

Age (X_3) was significantly related with the number of annual golfing visits of all golfers at the .01 level. The positive relationship of age with annual participation implies that as the age of all golfers increase, participation on the municipal courses will increase. Similar results were found in the three larger metropolitan cities discussed previously.

Price (X_1) was also significantly related with annual participation at the .01 level. Price elasticity was elastic (-1.20) indicating as price decreases, annual participation in golf on the municipal course increases at a more than proportional rate. The negative relationship is what one would expect from economic theory.

A breakdown of the price variable shows that green fees for all golfers averaged $2.50 per individual or 85 percent of the mean price of $2.96 per visit. Average distance traveled to the golf course was 6.3 miles. The transportation cost averaged $.46 per individual, or 15 percent of the mean price of $2.96.

The managerial occupation (X_{12}) was the only significant occupation variable (Table XXXIII, page 163). The positive sign indicates that it fell above the deleted occupational variable (X_{13}) on the Y axis. Thus, individuals in managerial positions played more often during the year than individuals in any of the other occupational categories. This represents the first category of golfers among the four cities sampled in which retired individuals were not the major users of the municipal courses. It is worthy to note, however, that special price rates were not offered retired individuals on the Johnson City municipal course.

Weekday golfers. One hundred and five weekday golfers were included in the sample of Johnson City municipal golfers. They averaged playing the municipal course 54 times per year at an average cost of $2.83 per visit. Annual income of the weekday golfers averaged $8,076, and was over $1,300 less than the annual income of weekend golfers. The weekday golfers averaged 33 years of age and had an average of 14 years of formal education. Significant relationships within the weekday user demand model are identified in Table XXXIII, page 163.

Price (X_1) was significantly related to the annual participation rates of weekday golfers at the .01 level. Average green fee cost for weekday golfers was $2.23, or 79 percent of the mean price of 2.83 percent. The average distance traveled was 6.7 miles at an average cost per golfer of $.60. Price elasticity was relatively inelastic at -.96 which implies that weekday golfers were not as responsive to price changes as weekend golfers.

Golfers in the student (X_{14}) and professional (X_7) occupational categories played golf more during the year than golfers in any of the other occupational categories. The relationship of these occupational variables, however, was not significantly different from the retired occupational category (X_{13}). Golfers employed as managers (X_{12}) played significantly (.10 level) less than golfers in the retired occupational category.

Weekend golfers. Of the 157 golfers sampled on the Johnson City municipal golf course, 52 played during the weekend. Their average

price per visit was $3.33 per individual. Annual income of weekend golfers averaged $9,442 per year. Weekend golfers averaged 38 years of age and had an average of 14 years of formal education.

Multiple R for the weekend category was .65 and R^2 was .42 percent. The F ratio was significant at the .01 level. Price (X_1) was the only significant variable in the final step (Table XXXIII, page 163).

Price elasticity was highly elastic at 2.79. Green fees for weekend golfers were 35 percent higher than on weekdays, at $3.00 per individual. Thus, green fees accounted for 90 percent of the mean price of $3.33. Weekend golfers traveled an average of 5.6 miles to the golf course and the individual transportation cost averaged $.33, or 10 percent of the mean price.

Occupation did not exert a significant influence on annual participation rate of weekend golfers on the Johnson City municipal golf course. Golfers employed in the operative occupation (X_{10}) were the major users of the course on weekends but were not significantly different from the retired occupational category (X_{13}).

Before 4:00 p.m. golfers. One hundred and twenty-two of the golfers interviewed played before 4:00 p.m. They averaged playing the course 57 times per year at an average cost of $3.02 per visit. Annual income averaged $8,450 per year. The before 4:00 p.m. golfers averaged 36 years of age and had an average of 13 years of education.

Multiple R for the model was .58, and the coefficient of determination was .34 percent. The ratio was 4.6 and significant at

the .01 level. Significant relationships within the user demand model are identified in Table XXXIII, page 163.

Price (X_1) of the golfing visit ($3.02) was considerably higher for the before 4:00 p.m. golfers than the price for the after 4:00 p.m. golfers ($2.55). Price elasticity was much lower for the before 4:00 p.m. golfers than for the after 4:00 p.m. golfers, indicating that the participation rates of the before 4:00 p.m. golfers would be less responsive to a price change than those of the after 4:00 p.m. golfers.

The before 4:00 p.m. category was the only category in which income (X_2) was significantly related to participation (.10 level). Income elasticity was relatively inelastic at .14.

After 4:00 p.m. golfers. Thirty-five golfers on the Johnson City municipal course were interviewed after 4:00 p.m. They averaged playing the course 49 times per year at an individual cost of $2.55. Annual income of the after 4:00 p.m. golfers ($11,028) was the highest among the five categories (Table XXXIII, page 163). The after 4:00 p.m. golfers averaged 37 years of age and had an average of 14 years of education.

As shown in Table XXXIII, page 163, the after 4:00 p.m. model had the highest R^2 (49 percent) among the five categories of golfers. The independent variables explained 49 percent of the variation in annual participation rates. The F ratio for the model also was significant at the .01 significance level.

Golfers employed in professional occupations (X_7) were the major users of the courses after 4:00 p.m. but the relationship was not

significantly different from the retired occupational variable. Golfers employed as laborers (X_{11}) and those who were students (X_{14}) played significantly less golf during the year than those golfers who were retired.

II. RURAL SECTOR

Five hundred and twenty-five golfers interviewed at 10 rural golfing associations provided the information used to evaluate the factor affecting annual participation rates in golf for the rural sector. A summary of the empirical findings resulting from the use of the user demand model is presented in Table XXXIV. These results are interpreted for each category of golfers.[8]

All golfers. All golfers played the rural courses an average of 62 times per year at an average cost of $3.35 per visit. In general, annual participation rates of golfers sampled on the rural courses were much greater than that of golfers sampled on the urban courses. This might be due to the availability of memberships at the rural courses which generally makes it more conducive for playing golf. Semiprivate golf courses like those under study are usually more accessible, less crowded and give members priority rights over nonmembers on the golf course.

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[8]The user demand model was also used to analyze participation rates for two additional categories of golfers using the rural courses: members and nonmembers of the respective golfing associations.

TABLE XXXIV

EMPIRICAL RESULTS OF USER DEMAND MODEL USED IN THE ANALYSIS OF 525 GOLFERS SAMPLED ON 10 RURAL GOLF COURSES IN TENNESSEE, 1969

Variable[a]		All Golfers	Weekday Golfers	Weekend Golfers	Before 4:00 p.m. Golfers	After 4:00 p.m. Golfers	Member Golfers	Nonmember Golfers
Number		525	413	112	271	254	266	259
Quantity	($\bar{Y}$)	62	56	86	64	59	93	29
Price per Visit	(X_1)							
mean		3.35	3.37	3.22	3.14	3.58	3.25	3.43
coefficient		-.051	-.054	-.048	-.074	-.006	.111	-.077
t value		1.09	1.04	.54	1.33	.07	1.87*	1.44
elasticity		-.17	-.18	-.15	-.23	-.02	.36	-.26
Annual Income	(X_2)							
mean		9,180	9,290	8,759	8,800	9,626	9,678	8,648
coefficient		.045**	.044**	.025	.079***	.012	.042**	.030
t value		2.53	2.13	.94	3.28	.42	2.58	1.13
elasticity		.42	.41	.22	.70	.12	.41	.26
Age	(X_3)							
mean		37	36	37	36	37	39	33
coefficient		-.006	.002	-.010	-.006	-.010**	-.016**	-.019**
t value		.10	.30	1.45	.75	2.05	2.50	2.20
Education	(X_4)							
mean		13	13	12	13	13	13	13
coefficient		-.063**	-.045	-.0006	-.049	-.070	-.010	-.109***
t value		2.20	1.31	.05	1.28	1.57	.34	2.68

TABLE XXXIV (continued)

Variable[a]		All Golfers	Weekday Golfers	Weekend Golfers	Before 4:00 p.m. Golfers	After 4:00 p.m. Golfers	Member Golfers	Nonmember Golfers
Clerical	(X_5)							
coefficient		-.712*	-.725	-.348	-.976**	-.554	-.828**	-.233
t value		1.89	1.56	.93	2.03	.98	2.54	.67
Farmer	(X_6)							
coefficient		.467***	-.457	1.634***	-1.428**	.165	-1.275**	-1.647*
t value		9.53	1.40	3.10	1.98	.76	2.24	1.69
Professional	(X_7)							
coefficient		-.841**	-.997**	-.300	-1.128**	-.666	-.845**	-.439
t value		2.14	2.06	.81	2.22	1.16	2.46	1.24
Sales	(X_8)							
coefficient		-.846**	-.830*	-.905**	-.872*	-.824	-1.405***	-.413
t value		2.11	1.69	2.28	1.72	1.38	4.09	1.32
Crafts	(X_9)							
coefficient		-1.093***	-1.078**	-.884**	-1.458***	-.804	-1.251***	-.270
t value		2.77	2.23	2.19	2.97	1.29	3.45	.72
Operative	(X_{10})							
coefficient		-1.321**	-1.381**	-	-1.851***	-.745	-.353	-1.360**
t value		2.50	2.20	-	2.82	.85	.64	2.46
Laborer	(X_{11})							
coefficient		-.525	-.737	-.274	-.569	-.614	-.839*	.277
t value		1.14	1.24	.72	.98	.88	1.91	.59

TABLE XXXIV (continued)

Variable[a]	All Golfers	Weekday Golfers	Weekend Golfers	Before 4:00 p.m. Golfers	After 4:00 p.m. Golfers	Member Golfers	Nonmember Golfers
Management (X_{12})[a]							
coefficient	-.705*	-.832*	-.225	-.808	-.522	-.764**	-.638
t value	1.82	1.75	.62	1.61	.93	2.32	1.63
Student (X_{14})							
coefficient	-.659	-.847	-	-.881	-.505	-.898**	-.597
t value	1.56	1.63	-	1.64	.82	2.35	1.63
Homemaker (X_{15})							
coefficient	-1.106*	-.914*	-1.870***	-2.284***	-.353	-1.188***	-1.154**
t value	2.43	1.67	3.24	3.61	.54	3.03	2.16
Other (X_{16})							
coefficient	-3.055***	-2.957***	-	-3.421**	-.007	-	-1.987**
t value	3.25	2.94	-	2.24	.78	-	2.33
Male (X_{17})							
coefficient	.213**	.845	.297	.916**	.239	.009*	.262
t value	2.11	.32	.20	2.35	.80	1.94	.78
R^2	.10	.11	.24	.13	.05	.12	.12
S.E.E.[b]	1.47	1.51	1.03	1.43	1.50	1.10	1.38
F	2.4***	1.9**	2.6***	2.7***	.89	2.5***	2.5***

*Significant at 0.10 level.

**Significant at 0.05 level.

***Significant at 0.01 level.

TABLE XXXIV (continued)

[a]The occupational variable, retired (X_{13}) was deleted and used as a base from which the other occupational variables were measured. The sex variable, female (X_{18}) was also deleted and used as a base to measure variations in participation by the sex of the golfer.

[b]S.E.E. = Standard error of estimate.

Socioeconomic characteristics of the rural golfers were similar to those of urban golfers playing on the municipal courses. The annual gross income for all rural golfers averaged $9,180. All rural golfers averaged 37 years of age and had an average of 13 years of formal education.

Regression results of the user demand model were not as good as expected. The multiple R was .32 and the coefficient of determination, R^2, accounted for only 10 percent of the variation in annual participation rates. Nevertheless, the F level for the model (F = 2.4) was significant at the .01 level and thus, provides a measure of reliability in the model since the F value indicates that at least one or more of the variables influenced annual participation of all rural golfers. As Table XXXIV, page 171, shows, 12 of the 18 variables were significantly related to annual participation.

Income (X_2) was the first variable to enter the model. It exhibited a positive relationship to the annual participation rates of rural golfers. That is, with an increase in income of one unit, participation rates will increase by the value of the income beta coefficient (.045). Income was significantly related to participation rates in the final step at the .05 significance level. Income elasticity for all rural golfers was inelastic at .42 indicating that as income increases 1 percent, annual participation rates increase only .42 percent.

Education (X_4) was the second variable to enter the model. As for all golfers in the urban sector, the education variable also

exhibited a negative relationship to annual participation rates for rural golfers. As noted earlier, this implies that as the educational level increases, the frequency of participation in golf decreases. Apparently, increases in the educational level have a dampening effect on the participation rates of golfers in both the urban and rural sectors.

Of interest is the failure of the age (X_3) and price (X_1) variables to enter the model for all rural golfers. Age was found to be highly significant and positively related to annual participation rates for all golfers in the urban sector. However, age has a negative and nonsignificant relationship to participation rates for all rural golfers. The failure of the price variable to show a significant relationship may be what one would expect with golfing associations of this nature, particularly for members of the association. That is, a basic commitment by the member to use the existing facilities has already been made. Thus, the price of the golfing visit may not represent a major obstacle. Furthermore, one would expect that golfers who were members of the association live closer to the golf course and thus have lower transportation costs in getting to the course.

Occupation was a significant variable influencing annual participation rates of all rural golfers. Golfers employed in farming (X_6) played a significantly (.01 level) higher number of days of golf during the year than golfers in any of the other occupational categories. Golfers in the retired occupational category (X_{13}) were the second highest users of the rural courses. All of the golfers in the other occupational categories played significantly less golf during the year than

golfers in the retired occupational category, except those golfers who were employed as laborers (X_{11}) and students (X_{14})

Weekday golfers. Four hundred and thirteen weekday golfers were included in the sample of rural golfers. Weekday golfers played the rural courses an average of 56 times per year at an average cost of $3.37 per visit. Annual income of weekday rural golfers averaged $9,290, which was over $500 more than the annual income of the weekend rural golfers. The weekday golfers averaged 36 years of age and had an average of 13 years of formal education.

Regression results of the user demand model for weekday golfers are shown in Table XXXIV, page 171. The multiple R was again quite low at .33, and R^2 was only 11 percent. The overall F value of 1.9 for the model, however, was significant at the .05 level.

Income (X_2) was the first variable to enter the model and was significantly related to participation rates of weekday golfers at the .05 level in the final step. Income elasticity was relatively inelastic at .41. The results for the four continuous variables, age, education, price and income, were very similar to that of the category of all golfers.

Annual participation rates for weekday golfers on the rural courses were greatest for those golfers in the retired occupational category (X_{13}). Golfers employed in farming were the second highest users of the courses on weekdays but the relationship between the farmer occupational variable (X_6) and the retired occupational variable was not significant. Golfers employed as salesmen (X_8), managers (X_{12}) and

homemakers (X_{15}) played significantly less (.10 level) golf during the year than golfers who were retired. Golfers employed in the professional (X_7), craft (X_9), operative (X_{10}) and other (X_{16}) occupations played significantly less golf than retired golfers, but at the .05 significance level.

Of particular interest is the components of the price variable (X_1). The greens fee charged on weekdays averaged $2.63, or 78 percent of the average price of the golfing visit ($3.37). The average distance traveled to the golf courses by weekday golfers was over 10 miles and the cost of transportation averaged $.74 per individual, or 22 percent of the average price of the golfing visit.

Weekend golfers. Of the 525 golfers sampled on the 10 rural golf courses, 112, or 21 percent, played during the weekend. The annual participation rate for weekend golfers of 86 times was much higher than the participation rate for weekday golfers. Most likely this was due to the increased availability of leisure time during weekends. Annual income for weekend golfers averaged $8,759. Weekday golfers averaged 37 years of age and had an average of 12 years of education.

The user demand model for weekend golfers yielded results that were also below expectations. The multiple R was .49, and the independent variables explained only 24 percent (R^2) of the variation in annual participation rates. The F ratio of 2.6, however, for the weekend user demand model was significant at the .01 level. The standard error of estimate was 1.03. Significant relationships resulting from

application of the user demand model for the category of weekend golfers are shown in Table XXXIV, page 171.

This represents the only category of rural golfers in which age, education, price and income were not significantly related to participation rates in the final model. It may be that the availability of leisure time dampens the effect of these interrelated variables on participation during weekends. Further, occupational differences which are due in a large part to income and education may have partially obscured the effect of these variables on participation during the weekends.

Golfers engaged in the farming occupation (X_6) played golf significantly (.01 level) more often on weekends during the year than golfers in any of the other occupations. Golfers who were retired were the second highest users of the courses on weekends. Golfers employed in the crafts (X_9) and as salesmen (X_8) played significantly less (.05 level) golf than retired golfers. The homemaker occupational variable (X_{15}) was also significantly less (.01 level) than the retired occupational variable. Those golfers employed as homemakers, however, played the courses less often on weekends during the year than golfers in any of the other occupational categories.

The mean price per visit for the category of weekend golfers was $3.22. The weekend green fee averaged $2.79, or 87 percent of the mean price per visit ($3.22). Weekend golfers traveled fewer miles, approximately seven, to the golf courses than did weekday golfers. Cost of transportation for weekend golfers averaged $.43 per individual, or 13 percent of the mean price per visit.

Before 4:00 p.m. golfers. Two hundred and fifty-four golfers were interviewed before 4:00 p.m. on the 10 rural golf courses. These golfers averaged playing the golf courses 59 times per year at an average cost per visit of $3.14. Annual income for these golfers averaged $8,800. Weekend golfers average 37 years of age and had an average of 13 years of education.

Regression results of the user demand model were similar to the results of previous categories. The multiple R was .36, and R^2 was 13 percent. However, the F value of 2.7 was significant at the .01 level. This implies that at least one variable in the model significantly influenced participation rates for the before 4:00 p.m. golfers. Significant variables within the chosen model are identified in Table XXXIV, page 171.

Income (X_2) was the first variable to enter the model and in the final step was significant at the .01 level. Income elasticity (.70) for the before 4:00 p.m. golfers was relatively elastic. As Table XXXIV, page 171, shows, these results differ with the results of the after 4:00 p.m. category of golfers, where income was not significant. This may be due to the fact that occupational differences are in a large part due to income. Further, those occupations which pay on a salary rather than hourly basis may provide more opportunities to play golf before 4:00 p.m. This is particularly true with respect to the professional occupations (X_7) which was significant at the .05 level in the final model.

Golfers in the retired occupational category (X_{13}) played more days of golf before 4:00 p.m. than golfers in any of the other occupational

categories. All of the other occupational categories, except labor (X_{11}), management (X_{12}) and student (X_{14}) played significantly less golf than golfers in the retired occupational category.

After 4:00 p.m. golfers. Two hundred and fifty-four golfers were interviewed on the 10 rural golf courses after 4:00 p.m. These golfers averaged playing the rural courses 59 times per year at an average cost of $3.58 per visit. Annual income averaged $9,626, which was $826 higher than the income for the before 4:00 p.m. golfers. The average age of the after 4:00 p.m. golfers was 37 years, and the average number of years of education was 13.

Regression results of the user demand model for the after 4:00 p.m. golfers were the poorest among the seven golfer categories. Multiple R was .23, and R^2 was only 5 percent. This represented the only model in which the F level was not significant. Variables entering the final model for the category of after 4:00 p.m. golfers are shown in Table XXXIV, page 171.

Age (X_3) was the only variable to enter the final model. The relationship between age and annual participation was negative. This implies that as the age of the rural golfers increased, the frequency of annual participation in golf decreased.

Member golfers. A total of 266, or 51 percent, of the golfers interviewed were members of the rural golfing associations. Their annual participation rates at the rural courses were the highest among the seven golfer categories. They averaged playing the golf courses 92 times per year at an average cost per visit of $3.25. Their average annual income, $9,678, was also the highest among all the categories. Member golfers averaged 39 years of age and had an average of 13 years of education.

The user demand model for the category of member golfers failed

to explain a significant amount of variation in annual participation rates in golf. The multiple R was .34, and the coefficient of determination was only .12 percent. Nevertheless, 13 of the 18 variables were significant at either the .10, .05 or .01 significance levels. Further, the F ratio (2.5) was significant at the .01 level. Significant relationships within the user demand model for member golfers are identified in Table XXXIV, page 171.

Income (X_2) was the first variable to enter the model and in the final step was positively correlated to the annual participation rates of the member golfers. That is, with a unit increase in income, annual participation will increase by .042, or the amount of the income beta coefficient. Income elasticity for member golfers was relatively elastic (.41).

Price of the golfing visit (X_1) was significantly related to participation rates at the .05 level. Of particular interest is that member golfers represented the only golfer category in which the price variable was significant. However, the relationship between price and annual participation rates was positive which is contrary to economic theory. Thus, in this case, with a unit increase in price, annual participation rates will increase. It may be that members of golfing associations of this nature are willing to pay more to obtain a certain amount of exclusiveness that generally accompanies higher prices.

Occupation was a significant variable influencing annual participation rates of member golfers of the rural recreational associations. Those member golfers who were retired played more days of golf during the year than golfers in any of the other occupational categories. Golfers in all of the remaining occupational categories, except operative (X_{10}), played significantly less golf during the year than the retired golfers (Table XXXIV, page 171).

The sex variable (X_{17}) was significant at the .10 level in the final step. This indicates that male member golfers participate more frequently during the year than do female member golfers at the 10 rural golf courses.

Nonmember golfers. Two hundred and fifty-nine nonmember golfers were interviewed at the 10 rural golfing associations. Their annual participation rates on the golf courses were the lowest among the seven categories (Table XXXIV, page 171). They averaged playing the courses 29 times a year at an average cost per visit of $3.43. Annual income of nonmembers averaged $8,649 and was also the lowest among all the categories. Nonmember golfers, playing the rural courses, averaged 33 years of age and had an average of 13 years of education.

Regression results of the user demand model for nonmember golfers were almost identical to that for the category of member golfers. The multiple R was .35, and R^2 was 12 percent. The F ratio of 2.5, however, was significant at the .01 level. Significant relationships within the model are identified in Table XXXIV, page 171.

Education (X_3) and age (X_4) were the first two variables to enter the model. In the final step these variables were significant at the .01 and .05 significance levels, respectively. However, both were negatively correlated with annual participation rates by nonmember golfers. These results were very similar to those obtained from golfers sampled on the municipal golf courses where memberships were not available.

A comparison of the components of the price variable (X_1) for members and nonmembers showed that nonmember golfers traveled farther (13 miles) than member golfers (six miles). Average cost of transportation per individual was $.90 and $.46, respectively, for nonmember and

member golfers. On the other hand, the average cost of the green fee per golfer was $2.53 and $2.79, respectively.

Nonmember golfers employed as laborers (X_{11}) were the major users of the golf courses on an annual basis. The relationship, however, between the labor occupational variable and the retired occupational variable (X_{13}) was not significant. Nonmember golfers who were retired ranked second in the number of days played on the courses. The homemaker (X_{15}), operative (X_{10}), farmer (X_{6}) and other (X_{16}) occupational variables were all significantly less than the retired occupational variable (Table XXXIV, page 171.

III. STATEWIDE ANALYSIS

The user demand models used to explain annual participation rates in golf on municipal courses in urban areas and on FHA financed courses in rural areas produced results that, in general, were below expectations. A suggestion as to why so little of the variation in annual participation rates was accounted for was the exclusion of leisure time variables from the models. Thus, it was decided to use a modified user demand model that would include variables related to leisure time as well as the variables used in the previous models tested. A different set of data, however, had to be used because data on leisure time were not available for use in the models already tested (Table XXXV).

The data used in the modified model were obtained from a statewide recreation survey of randomly selected family units conducted by the Tennessee Department of Conservation. The data were from 2,811 family units and included approximately 9,800 persons. Annual participation rates for 44 different recreational activities, including golf, along

TABLE XXXV

COMPARISON OF EMPIRICAL RESULTS OBTAINED FROM THE USER DEMAND MODELS, FOR ALL GOLFERS SAMPLED ON THE URBAN MUNICIPAL GOLF COURSES, RURAL SEMIPRIVATE GOLF COURSES AND IN THE STATEWIDE SURVEY, TENNESSEE, 1969

Variable		Urban Municipal Golf Courses				Rural Semi-Private Golf Courses	Statewide Survey
		Memphis	Nashville	Knoxville	Johnson City		
Number		771	614	254	157	525	259
Quantity	($\bar{Y}$)	46	53	53	59	62	38
Price per Visit	(X_1)						
mean		2.49	2.59	3.23	2.96	3.35	--
coefficient		-.169**	-.329***	-.193	-.404***	-.051	--
t value		2.50	4.47	1.38	4.22	1.09	--
elasticity		-.42	-.85	-.62	-1.20	.17	--
Annual Income	(X_2)						
mean		9,586	9,287	8,507	8,401	9,180	9,969
coefficient		.035***	-.032*	.026	-.520	.045**	.025
t value		2.75	1.94	.87	1.47	2.53	.44
elasticity		.34	.30	.21	-4.36	.42	.19
Age	(X_3)						
mean		36	36	36	36	37	40
coefficient		.012***	.022***	.009	.553***	-.006	.203
t value		2.62	4.43	.94	4.91	.10	.46
Education	(X_4)						
mean		14	14	13	13	13	13
coefficient		-.048**	-.072***	-.184***	-.682	-.063**	.504
t value		2.09	2.62	4.24	1.17	2.20	.80

TABLE XXXV (continued)

Variable		Urban Municipal Golf Courses				Rural Semi-Private Golf Courses	Statewide Survey
		Memphis	Nashville	Knoxville	Johnson City		
Clerical	(X_5)						
coefficient		-.609**	-.762***	-.960**	--	-.712*	-1.250***
t value		2.46	3.77	1.98	--	1.89	4.30
Farmer	(X_6)						
coefficient		-.069	--	--	--	.467***	-1.203***
t value		1.15	--	--	--	9.53	4.01
Professional	(X_7)						
coefficient		-.959***	-.287	-.756	--	-.841**	-1.233***
t value		3.69	1.50	1.55	--	2.14	4.53
Sales	(X_8)						
coefficient		-.585**	-.313	-.297	.122	-.846**	-.984***
t value		2.45	.87	.54	.31	2.11	3.40
Crafts	(X_9)						
coefficient		-.534	-.243	-.849*	-.299	-1.093***	-1.142
t value		1.61	.98	1.73	.73	2.77	4.09***
Operative	(X_{10})						
coefficient		-.504	-.694	-.375	.417	-1.321**	-1.161***
t value		1.44	1.48	.60	.32	2.50	4.03
Laborer	(X_{11})						
coefficient		-.875**	.433	-.495	-.310	-.525	-1.212***
t value		2.10	1.40	.80	.53	1.14	4.11

TABLE XXXV (continued)

Variable		Urban Municipal Golf Courses				Rural Semi-private Golf Courses	Statewide Survey
		Memphis	Nashville	Knoxville	Johnson City		
Management	(X_{12})						
coefficient		-.793***	-.182	-1.071*	.543*	-.705*	4.269
t value		3.10	.83	1.81	1.89	1.82	4.45***
Student	(X_{14})						
coefficient		-.734***	-2.675***	-.936	.326	-.659	-1.223***
t value		2.69	4.11	1.48	.85	1.56	3.84
Homemaker	(X_{15})						
coefficient		-1.006**	.236	-.646	.468	-1.106**	--
t value		2.32	1.12	.87	.72	2.43	--
Other	(X_{16})						
coefficient		-.008	--	-.985	-.440	-3.055***	--
t value		1.61	--	.97	.31	3.25	--
Male	(X_{17})						
coefficient		.713***	.138	.401	.177	.213**	--
t value		3.33	1.34	.86	.37	2.11	--
Vacation Days	(X_{18})						
mean		--	--	--	--	--	15
coefficient		--	--	--	--	--	1.007***
t value		--	--	--	--	--	3.05

TABLE XXXV (continued)

Variable		Urban Municipal Golf Courses				Rural Semi-private Golf Courses	Statewide Survey
		Memphis	Nashville	Knoxville	Johnson City		
Holidays	(X_{19})						
mean		--	--	--	--	--	6
coefficient		--	--	--	--	--	1.765***
t value		--	--	--	--	--	2.24
Weekend Leisure	(X_{20})						
mean		--	--	--	--	--	13
coefficient		--	--	--	--	--	1.253*
t value		--	--	--	--	--	1.95
Weekday Leisure	(X_{21})						
mean		--	--	--	--	--	2
coefficient		--	--	--	--	--	-10.612***
t value		--	--	--	--	--	2.68
R^2		.11	.14	.17	.29	.10	.37
S.E.E.		1.3	1.4	1.3	1.3	1.4	68.7
F		6.5***	8.4***	3.4***	4.8***	2.4***	7.4***

*Significant at 0.10 level.

**Significant at 0.05 level.

***Significant at 0.01 level.

with data on leisure time variables and important socioeconomic characteristics of the participants were collected. The data included participation rates of the participants on all types of golf courses, both public and private. One important item on which data were not collected was the cost of each golfing visit, which normally includes green fees and transportation cost for the trip to the golf course. Thus, to the degree that such costs affect participation, the present model is limited in explaining annual participation rates in golf.

The hypothesis tested was that participation in golf in Tennessee was affected significantly by the independent variables specified. The user demand model subject to test was:

$$Y = a_0 + b_1X_1 + b_2X_2 + \ldots + b_iX_i + \ldots + b_{n-1}X_{n-1} \quad i = X_1, \ldots X_{20}$$

where

Y = annual number of visits by the head of the household to all types of golf courses

X_1 = annual gross family income

X_2 = age of the head of the household

X_3 = education of the head of the household.

Occupation of the head of the household:

X_4 = clerical

X_5 = rancher or farmer

X_6 = professional, technical

X_7 = sales

X_8 = craftsman, foreman

X_9 = operative

X_{10} = labor

X_{11} = management, proprietor

X_{12} = retired

X_{13} = student

X_{14} = homemaker

X_{15} = other (armed services and disabled)

X_{16} = number of vacation days for the household head

X_{17} = number of holidays for the household head

X_{18} = average hours of leisure per weekend for household head

X_{19} = average hours of leisure per average weekday for household head

X_{20} = average hours worked per week for household head.

Leisure is time free from formal work and duties. Thus, the five new variables added to the user demand model (X_{16} through X_{20}) are intended to measure free time and its effect upon participation in golf. All the variables in the statewide user demand model were allowed to enter the regression equation freely. The resulting significant relationships for the final step are shown below.

$$Y = 13.23 + 4.269X_{11} + 1.007X_{16} + 1.765X_{17} + 1.253X_{18}$$

Standard error	(.959)	(.329)	(.787)	(.642)
t	4.45***	3.05***	2.24**	1.95*

$$- 10.612X_{19} - 1.1610X_{9} - .984X_{7} - 1.233X_{6} - 1.250X_{4} - 1.212X_{10}$$

Standard error	(3.960)	(3.99)	(.289)	(.272)	(.290)	(.301)
t	2,68**	4.03***	3.40***	4.53***	4.30***	4.11***

$$-1.203X_5 - 1.142X_8 - 1.223X_{13}$$

Standard error	(.300)	(.279)	(.318)
t	4.01***	4.09***	3.84***

The multiple R resulting from using the statewide user demand model was .61 and the coefficient of determination, R^2, was .37. Thus, the variation in the number of times individuals played golf per year that was explained by the new model was considerably higher than for the models tested using data collected from golfers playing the municipal and rural courses. One may conclude, therefore, that the introduction of the leisure variables into the model was important since they contributed materially to explaining the number of times participants played golf.

The first variable to enter the model was the managerial occupational variable (X_{11}). It was the only occupational variable with a positive coefficient and thus fell above the deleted occupational variable (X_{12}) on the Y axis. This means that persons in the managerial occupational group played golf more times during the year than did individuals in the other occupational groups. In the final step, the difference was significant at the .01 level.

The next four variables to enter the model (X_{16} through X_{19}) that helped explain participation rates were the leisure time variables. The number of vacation days of the golfers (X_{16}) averaged 15 days per

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*Significant at 0.10 level.

**Significant at 0.05 level.

***Significant at 0.01 level.

year and this variable was significant in explaining participation rates at the .01 level. The participants had an average of six holidays per year (X_{17}) and this variable was significant at the .05 level. The number of weekend leisure hours (X_{18}) for the participants averaged 13 per weekend and the variable was also significant at the .05 level. Weekday leisure hours (X_{19}) averaged two hours a day for each participant and was significant at the .01 significance level.

Quite surprisingly, income, age, and education were not significant variables in the final step of the analysis when using the statewide user demand model. These socioeconomic variables in the other user demand model, however, made a significant contribution to the explanation of variation in the annual participation rates for those golfers interviewed on the urban and rural golf courses. A comparison of the two models showed that the mean income for the golfers sampled randomly on a statewide basis ($9,969) was $977 higher than the average mean income for all golfers sampled selectively on the municipal and FHA golf courses ($8,992). The average age of the golfers sampled in the statewide study was 40 years; whereas the age of the golfers interviewed on the municipal and FHA courses averaged 36 years. The average number of years of education for golfers in both studies was 13.

The statewide study was structured to include respondents from eight recreational regions of the state (Appendix F). Table XXXVI shows the distribution of annual participation rates in golf by the sample types for the eight regions. Annual participation rates were largest for the sample type which included husband, wife, and children. The

TABLE XXXVI

DISTRIBUTION OF AVERAGE ANNUAL PARTICIPATION RATES IN GOLF, BY SAMPLE TYPES,[a] EIGHT RECREATION REGIONS IN TENNESSEE, 1969

Region	H, W & C		H & W	H & C		W & C		Other Family Units		All Adults	All Children
	A	C	A	A	C	A	C	A	C		
01	2.16	0.37	3.04	0.00	0.00	6.86	4.17	0.63	0.00	2.50	0.74
02	1.58	0.95	0.78	0.00	0.00	0.23	0.02	0.00	0.56	1.16	0.83
03	1.38	0.43	0.05	0.00	0.00	0.00	0.00	0.13	0.00	0.82	0.39
04	1.83	0.61	1.53	0.00	0.00	0.00	0.00	0.00	0.00	1.53	0.53
05	3.84	2.11	1.73	0.00	0.00	0.48	0.61	0.00	0.00	2.88	1.94
06	3.61	0.61	3.07	0.00	0.00	0.00	0.00	0.00	0.00	3.22	0.54
07	1.74	0.36	0.49	0.00	0.00	0.00	0.00	0.00	1.67	1.09	0.37
08	3.16	1.21	0.97	3.33	0.00	0.00	0.00	0.27	0.00	2.08	1.07
State Summary	2.64	1.06	1.39	0.83	0.00	0.90	0.46	0.15	0.24	2.00	0.98
Number in Sample	2,998	2,584	1,758	12	18	126	275	371	62	5,265	2,939

[a]Sample types were defined according to the composition of the family unit interviewd, husband (H), wife (W), and children (C). H and W are classified as adults (A).

state summary for this type sample type indicated an average annual participation rate in golf of 2.64 days per year for adults and 1.06 days for children. Further, annual participation rates in golf by all adults sampled were more than twice that for all children.

With respect to income, participation rates rose rapidly beginning at the $10,000 to $14,000 income level (Table XXXVII). The state summary shows that adult golfers in the $25,000 and over bracket had the greatest participation, with an average of 12.96 times per year. The greatest participation for children, however, occurred in those families in the $15,000 to $24,999 income range.

According to age, the frequency of annual participation was the largest for those golfers in the 29 years and under category (Table XXXVIII). Golfers in this age group averaged playing golf 2.85 times per year. Participation rates remained fairly constant up to the 50-59 years age group, with the sharpest decline occurring in the 70 years and over age group.

Table XXXIX shows the distribution of average annual participation rates in golf by education. In general, the frequency of annual participation increased as the years of formal education increased. Adult golfers with 18 or more years of education had the greatest participation, with a statewide average of 9.24 golfing trips per year.

On a statewide basis, the greatest participation according to occupation (X_4 through X_{15}) of the head of the sample unit occurred in the adult student occupational group (Table XL). This group averaged 10.63 golfing trips per year. Professional, clerical, and managerial

TABLE XXXVII

DISTRIBUTION OF AVERAGE ANNUAL PARTICIPATION RATES IN GOLF, BY FAMILY INCOME, EIGHT RECREATION REGIONS IN TENNESSEE, 1969

Region	Under $3,000		$3,000-$5,999		$6,000-$7,999		$8,000-$9,999		$10,000-$14,999		$15,000-$24,999		$25,000 and Over	
	A	C	A	C	A	C	A	C	A	C	A	C	A	C
01	0.89	3.31	1.28	0.00	0.99	0.21	2.29	0.68	14.63	0.90	12.50	1.00	9.00	0.00
02	0.22	0.05	0.46	0.12	0.37	0.20	1.26	0.04	3.16	4.91	5.06	2.35	0.00	0.00
03	0.00	0.00	0.04	0.61	0.79	0.21	3.39	1.39	3.53	0.00	0.00	0.00	0.00	0.00
04	0.00	0.13	0.33	0.25	1.58	0.00	2.79	1.64	2.65	0.15	7.71	5.80	62.50	0.00
05	0.02	0.04	1.15	0.00	1.54	1.34	3.40	2.35	6.63	3.35	15.85	8.13	0.50	0.00
06	0.00	0.00	2.56	0.00	1.21	0.75	0.29	0.28	5.09	0.67	11.67	0.00	26.25	1.67
07	0.00	4.29	0.13	0.00	0.51	0.00	1.55	0.12	1.93	0.15	2.86	1.50	0.00	0.00
08	0.04	0.00	0.70	0.21	1.08	0.74	1.54	0.27	7.54	3.93	13.59	7.69	10.00	3.33
State Summary	0.16	0.41	0.79	0.16	1.07	0.54	2.07	0.91	5.68	2.56	9.22	4.03	12.96	1.43
Number in Sample	912	327	1,242	612	998	616	715	508	674	443	116	86	24	21

TABLE XXXVIII

DISTRIBUTION OF AVERAGE ANNUAL PARTICIPATION RATES IN GOLF, BY AGE OF THE HEAD OF THE SAMPLE UNIT, EIGHT RECREATION REGIONS IN TENNESSEE, 1969

Region	Under 29 years		30-39 years		40-49 years		50-59 years		60-69 years		70 years and over	
	A	C	A	C	A	C	A	C	A	C	A	C
01	4.36	10.67	2.93	0.29	2.26	0.20	0.55	0.19	4.49	2.08	0.00	0.00
02	1.19	1.00	1.71	0.03	2.30	1.84	0.83	0.26	0.00	0.18	0.00	0.00
03	1.77	0.00	2.43	0.39	1.24	0.62	0.09	0.12	0.00	0.38	0.00	0.00
04	1.69	0.00	2.86	0.10	0.98	0.95	2.41	0.43	0.00	0.00	0.00	0.00
05	3.85	0.00	2.72	0.15	4.31	2.84	3.00	3.99	0.08	0.00	0.00	0.00
06	5.75	0.00	1.96	0.00	2.23	0.91	3.22	0.60	6.90	0.00	0.00	0.00
07	6.13	0.00	1.84	0.09	0.65	0.26	0.58	2.50	0.00	5.00	0.00	0.00
08	1.80	0.00	3.90	0.85	2.86	0.92	0.97	1.93	1.56	2.11	0.00	0.00
State Summary	2.85	0.91	2.67	0.32	2.53	1.39	1.57	1.37	1.41	1.06	0.00	0.00
Number in Sample	674	134	1,022	942	1,211	1,222	1,068	462	813	126	477	53

TABLE XXXIX

DISTRIBUTION OF AVERAGE ANNUAL PARTICIPATION RATES IN GOLF, BY YEARS OF FORMAL EDUCATION OF THE HEAD OF THE SAMPLE UNIT, EIGHT RECREATION REGIONS IN TENNESSEE, 1969

Region	7 years or less		8-10 years		11-13 years		14-17 years		18 years or more	
	A	C	A	C	A	C	A	C	A	C
01	0.00	0.00	0.62	1.43	2.49	0.56	2.38	0.00	26.23	2.00
02	0.14	0.04	0.64	0.10	1.38	1.21	2.75	2.51	2.84	0.00
03	0.01	0.00	0.06	0.78	1.34	0.26	2.61	0.53	1.06	0.40
04	0.03	0.10	0.51	0.12	1.35	0.08	6.41	3.82	6.25	0.00
05	0.16	0.02	0.81	0.75	3.30	2.21	5.80	2.18	9.69	7.15
06	0.22	0.38	0.00	0.40	2.82	0.21	6.02	1.07	11.44	1.76
07	0.03	2.50	0.00	0.11	1.15	0.25	3.33	0.31	2.12	0.00
08	0.00	0.30	0.27	0.08	2.88	1.15	4.17	3.02	18.33	0.00
State Summary	0.08	0.19	0.44	0.42	2.37	1.10	4.30	2.10	9.24	2.25
Number in Sample	928	468	1,044	734	1,945	1,143	766	450	206	129

TABLE XL

DISTRIBUTION OF AVERAGE ANNUAL PARTICIPATION RATES IN GOLF, BY OCCUPATION OF THE HEAD OF THE SAMPLE UNIT, EIGHT RECREATION REGIONS IN TENNESSEE, 1969

Region	Clerical		Rancher/ Farmer		Pro- fessional		Sales		Craftsman		Operative		Laborer		Manage- ment		Retired		Armed Forces		Student		Homemaker		Disabled		Service Worker	
	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C
01	8.72	0.67	0.45	0.00	15.48	1.20	0.00	0.00	1.57	0.00	1.86	0.66	1.61	4.32	2.65	0.57	0.00	0.00	25.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
02	0.49	0.48	0.12	0.06	4.37	0.29	1.29	8.75	1.57	0.27	0.00	0.00	1.55	0.06	2.34	3.84	0.05	0.29	0.00	0.00	0.94	0.00	0.00	0.03	0.00	0.14	0.00	0.00
03	1.00	0.00	0.00	0.09	0.34	0.40	1.83	0.71	2.92	0.00	0.00	0.00	0.16	0.00	4.03	1.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04	0.00	0.00	0.05	0.00	3.82	1.68	4.06	0.00	0.30	0.00	1.12	0.00	0.59	0.34	3.29	1.49	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00
05	6.18	3.23	0.39	0.01	6.19	3.08	3.82	3.51	1.36	1.10	1.33	0.00	0.86	1.20	8.43	3.38	0.00	0.00	0.60	4.00	2.67	0.00	0.00	0.00	0.00	0.00	9.00	12.00
06	4.38	3.33	1.52	0.37	6.07	1.21	0.00	0.00	10.53	0.00	1.98	0.55	0.29	0.58	1.02	0.17	0.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
07	0.83	1.25	0.28	0.71	1.29	0.00	1.88	1.50	4.77	0.00	0.08	0.00	0.00	0.00	3.21	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
08	10.66	2.16	0.50	0.37	4.53	2.29	1.13	0.55	2.28	0.81	0.29	2.08	0.46	0.00	6.34	3.53	0.36	0.00	2.40	0.00	3.50	0.00	0.00	0.00	0.00	0.00	3.60	0.16
State Summary	4.86	1.61	0.44	0.21	4.89	1.60	2.18	1.95	2.47	0.53	0.87	0.63	0.85	0.68	4.50	2.46	0.09	0.10	4.13	0.48	10.63	0.00	0.00	0.01	0.00	0.06	3.27	2.34
Number in Sample	196	120	1,074	536	665	430	267	190	542	392	476	244	590	370	518	330	519	51	39	25	32	3	169	148	134	68	44	32

occupational groups participated in golf an average of more than four times per year.

CHAPTER V

SUMMARY

One of the fastest growing recreational activities today is golfing. The National Golf Foundation reports that on the basis of expected population growth alone, it is doubtful that there will ever be enough golf courses to meet the demand. A study conducted by the Tennessee Department of Conservation concluded that by the year 2000, Tennessee will need 95 additional nine hole courses and 67 18 hole courses.

At the present time, Tennessee has 176 golf courses. Fifty-one percent of these courses are privately owned and operated; 31 percent are operated on a semiprivate basis and 12 percent are municipally operated. Thus, only 43 percent of all the golf courses in the state may be considered as being open to the general public on a green fee paying basis. The problem of the lack of golfing facilities open to the general public is most acute in the urban areas where the majority of golf in Tennessee is played. Municipal courses in these areas have not been able to adequately meet the demand for golfing services. The high cost of land in urban areas has hampered expansion of golfing facilities. As a result, public and private investors have begun developing golf courses in the outlying rural areas of the state.

The broad objectives of this analysis were to study urban and rural golfing facilities in Tennessee and their patrons. Specific

objectives were: (1) to determine the costs and returns associated with urban and rural golfing facilities in Tennessee, and (2) to identify and evaluate socioeconomic factors affecting participation in golf on urban and rural courses in Tennessee.

I. COSTS AND RETURNS

Capital investment per golf course for the nine 18 hole urban golf courses averaged $494,309. Construction costs averaged $249,605 per course and accounted for 50 percent of the total capital invested. Land costs averaged $194,962 per course and represented 39 percent of the investment. Equipment costs averaged $49,742 per course and accounted for 11 percent of the total capital investment. For the four 9 hole urban courses, total capital investment per course was $302,988. Land costs accounted for $171,156, or 56 percent; construction costs, $112,319, or 37 percent; and equipment costs $19,513, or 6 percent of the total investment.

Capital investment per golfing association for the 10 nine hole rural golf courses averaged $183,559. Construction costs averaged $134,656 per association and accounted for 73 percent of the total capital invested. Land costs averaged $31,968 per association and represented 17 percent of the investment, and equipment costs amounted to $16,935, or 10 percent of total capital investment.

Golf course construction for the nine 18 hole urban golf courses averaged $157,944, or 63 percent of total construction cost. Thus, the average cost of construction per golf hole was $8,775. Construction

costs of buildings and ancillary facilities averaged $91,661, or 37 percent of total construction costs. For the four 9 hole urban courses, the cost of construction of the courses averaged $65,675, or 59 percent of total construction costs. Thus, the average cost of construction per golf hole, from tee to green, was $7,297. The construction cost of buildings and ancillary facilities for the nine hole courses averaged $46,644, or 41 percent of total construction cost.

Golf course construction for the 10 nine hole rural golf courses averaged $50,414, or 37 percent of total construction costs. The average cost of construction per golf hole was $5,602. The costs of buildings and ancillary facilities accounted for the major share, $84,242 per association, or 63 percent of total construction cost.

Annual operating costs for the nine 18 hole urban courses averaged $110,123 per course, or $6,118 per hole. Variable costs accounted for 89 percent of the annual operating costs, averaging $98,111 per course. Labor cost was the major variable cost item, averaging $60,992 per course, or 62 percent of total variable cost. This was equivalent to $3,388 per golf hole. Fixed costs for the 18 hole courses averaged $12,012 per course, or 11 percent of the total annual operating costs. This represented a fixed cost of $667 per golf hole. Annual interest charges accounted for the major share, $6,055 or 50 percent, of the fixed cost.

Annual operating costs for the four 9 hole urban courses averaged $57,999 per course, or $6,444 per hole. Variable costs amounted to $52,865 per course, or 91 percent of the annual operating cost. This

represented a variable cost of $5,874 per golf hole. Labor cost for the nine hole urban courses amounted to $32,959 per course, which represented 62 percent of the total variable cost. This was equivalent to a labor cost of $3,621 per hole. Fixed costs for the nine hole golf courses averaged $5,134 per course, or $570 per golf hole.

Annual operating costs for the 10 nine hole rural golfing associations averaged $34,869 per association. This amounted to an annual operating cost of $3,874 per golf hole. Variable costs averaged $23,027 per association, or 66 percent of annual operating costs. This represented a variable cost of $2,559 per golf hole. Labor cost accounted for 68 percent of the total variable cost, averaging $15,602 per association. This was equivalent to $1,734 per golf hole. Labor accounted for three-fourths of the cost of maintenance required to keep the golf courses in playing condition. Fixed costs for the 10 golfing associations averaged $11,842 per association and accounted for 34 percent of total annual operating costs. This represented a fixed cost of $909 per golf hole. Annual interest charges on capital investments accounted for the major share, $4,912 or 42 percent, of the fixed cost.

Annual gross income for the urban golf courses averaged $150,990 per course for the 18 hole courses and $61,640 per course for the nine hole courses. The daily green fee ticket was the principal source of income for all urban courses. For the nine 18 hole courses, green fees averaged $86,492 per course, or 57 percent of the annual gross income. For the four 9 hole courses, green fees accounted for 48 percent of annual gross income, averaging $29,664 per course.

Annual gross income for the 10 nine hole rural golfing associations amounted to $39,691 per association. Annual membership dues were the principal source of income for the associations. Membership dues averaged $26,797 per association, or 67 percent of the annual gross income. Green fees averaged $3,786 per association, or only 10 percent of annual gross income. This was in sharp contrast to the 57 percent contribution green fees made to total gross income of the urban golf courses. The difference was due primarily to differences in participation rates which were affected by the semiprivate nature of the rural golfing associations and their distance from heavily populated areas. Green fee policies of the rural courses and the use of the courses were generally arranged so that members were given priority over nonmembers, such as the giving of prime tee-off times on weekends. Participation by nonmembers was often limited to a given number of times per year and then only when accompanied by a member of the association.

Net income received from the operation of the nine 18 hole urban golf courses averaged $40,867 per golf course. This represented an 8.2 percent return on capital investment to the respective municipalities. Net income for the four 9 hole urban courses averaged $3,641 per golf course, or a 1.2 percent return on capital investment.

Net income received from the operating of the 10 nine hole rural golfing associations averaged $4,822 per association. This represented a 2.6 percent return on capital investment to the respective golfing associations.

II. ANALYSIS OF PARTICIPATION IN GOLF

The user demand models used to explain variation in annual participation rates in golf produced results that, in general, were below expectations. A comparison of the results of the user demand model for all golfers sampled on the urban and rural courses shows that the highest coefficient of determination, R^2, obtained was .29 (Table XXXV, page 185). Thus, the independent variables specified in the user demand model accounted for only 29 percent of the variation in annual participation rates.

The analysis showed that participation in golf in Tennessee was significantly influenced by a number of socioeconomic variables, all of which varied in direction and magnitude in their effect upon annual participation rates. Age (X_3) was found to be a highly significant variable for all golfers sampled on three of the four urban municipal golf courses. Furthermore, age generally exhibited a positive relationship with annual participation rates. This implies that as the age level increases, annual participation rates may also be expected to increase. The average age for all urban golfers was 36 years; for all rural golfers, 37 years and for those golfers sampled randomly on a statewide basis, 40 years.

Education (X_4) exerted a strong influence on participation rates for all golfers in both the urban and rural sector. Contrary to expectation, however, the relationship between education and participation in golf was negative. In fact, education was the only socioeconomic

variable in the user demand model whose sign remained consistent throughout the analysis. The negative relationship exhibited by the results implies that as the educational level increases, participation rates in golf may be expected to decrease. The educational level for all golfers sampled averaged 13 years of formal education.

Income (X_2) for all golfers sampled did not exhibit a uniform relationship with annual participation in golf. The income variable for all golfers sampled at the Memphis municipal golf courses and at the rural golf courses displayed a significant positive relationship with annual participation rates. This supports the hypothesis that golfing services may be considered a normal good and as income increases, annual participation rates may also be expected to increase. On the other hand, the income variable for all golfers sampled at the Nashville municipal courses exhibited a significant negative relationship with participation rates. This, in turn, suggests that golfing services may not be considered a normal or superior good and as income increases, annual participation rates in golf may decrease.

Average annual income for all Memphis golfers, $9,586, was the highest among the four urban areas sampled. The annual income for all rural golfers averaged $9,180. The income for those golfers sampled randomly and on a statewide basis averaged $9,969.

Price (X_1) of the golfing experience for all golfers sampled showed a consistently negative relationship with annual participation rates. The results were consistent with theory which states that as prices increase, quantities purchased will decrease. It should be

pointed out, however, that when all golfers were broken down into various categories, positive relationships between price and participation rates were often observed. This may be the result of certain aesthetic values desired by many golfers and which can only be found at the more expensive or exclusive golf courses.

Price elasticity for all golfers in the urban and rural sectors was generally inelastic. Thus, unit changes in the price of the golfing visit were generally accompanied by a less than proportional change in the amount of golfing services purchased.

Occupational variables, X_5 through X_{16}, for all urban golfers were characterized by minus beta coefficients. This indicates that these variables fell below the retired occupational variable (X_{13}) on the Y axis. Thus, the annual participation rates for those urban golfers who were retired were greater than those for individuals in other occupational categories. One of the major reasons for this was that all the municipalities offered special green fee rates for retired and disabled individuals. Of special interest is the fact that the sales occupational variable (X_8) was significant in explaining participation rates only for those golfers in Memphis. It may be that private golf courses offer a better opportunity for the salesman to mix business with pleasure.

For the rural golf courses, farmers and ranchers (X_6) represented the major users of the courses on an annual basis. Retired individuals, however, played the courses more frequently during the year than individuals in any of the other occupational categories.

Since the user demand model used to explain annual participation rates of golfers in the urban and rural sectors produced results that were below expectation, a modified user demand model using a different set of data was used. The data used in the modified model were obtained from a statewide recreation survey of randomly selected family units conducted by the Tennessee Department of Conservation. The modified user demand model included variables related to leisure time and all the variables used in the previous model except price of the golfing visit (Table XXXV, page 185). The multiple R resulting from using the modified model was .61 and the coefficient of determination, R^2, was .37. Thus, the variation in the number of times individuals played golf per year that was explained by the new model was considerably higher than for the model tested using data collected from golfers playing the municipal and rural courses. One may conclude that the introduction of the leisure variables, number of vacation days, number of holidays, hours of leisure per weekend, hours of leisure per average weekday and average hours worked per week into the model was important since they contributed materially to explaining the number of times participants played golf per year.

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APPENDIXES

APPENDIX A

TABLE XLI

NUMBER OF GOLF COURSES BY POPULATION GROUPINGS OF CITIES WITH AN AVERAGE OF PEOPLE SERVED BY TYPE OF GOLF COURSE, TENNESSEE, 1969

Cities	Population (1970)[a]	Type of Course			
		Municipal	Semiprivate[b]	Private	Other[c]
Over 100,000					
Chattanooga	127,000	2	1	6	-
Knoxville	175,000	1	1	5	-
Memphis	560,000	8	3	6	2
Nashville	260,000	6	1	6	-
Total	1,122,000	17	6	23	2
Average Population per Course		66,000	187,000	48,783	561,000
25,000-45,000					
Clarksville	38,000	-	1	2	-
Jackson	41,500	-	1	3	-
Johnson City	35,200	1	-	2	-
Kingsport	33,500	-	-	3	-
Morristown	25,300	1	-	1	-
Murfreesboro	28,000	-	-	2	-
Oak Ridge	30,000	-	-	2	-
Total	231,500	2	2	15	-
Average Population per Course		115,750	115,750	15,433	
15,000-24,999					
Bristol	20,200	1	1	1	-
Cleveland	20,500	1	1	1	-
Columbia	22,000	-	1	1	-
Tullahoma	16,000	-	-	1	-
Total	78,700	2	3	4	
Average Population per Course		39,350	26,333	19,675	

TABLE XLI (continued)

Cities	Population (1970)[a]	Type of Course			
		Municipal	Semiprivate[b]	Private	Other[c]
10,000-14,999					
Athens	13,300	-	-	1	-
Cookeville	14,000	-	-	2	-
Dyersburg	14,400	-	1	-	-
Elizabethton	12,400	1	-	-	-
Gallatin	12,600	-	-	1	-
Greeneville	14,300	-	1	1	-
Harriman	9,500	-	-	1	-
Humboldt	10,200	-	-	2	-
Lawrenceburg	10,300	-	1	-	-
Lebanon	12,700	-	-	2	-
Maryville	12,000	-	2	1	-
McMinnville	10,800	-	1	1	-
Shelbyville	12,400	-	1	-	-
Smyrna	11,000	-	-	-	1
Total	159,600	1	6	12	1
Average Population per Course		159,600	26,600	13,300	159,600
5,000-9,999					
Brownsville	6,041	-	-	1	-
Covington	5,944	-	-	1	1
Dickson	5,897	-	-	2	-
Fayetteville	7,438	-	1	-	-
Hendersonville	7,000	-	-	1	-
Lafollette	7,130	-	1	-	-
Lenoir City	6,080	-	2	-	-
Lewisburg	7,007	-	1	-	-
Manchester	6,038	-	-	1	-
Milan	6,309	-	-	1	-
Newport	7,282	-	1	-	-
Paris	9,700	-	-	1	-
Pulaski	6,616	-	-	1	-
Rockwood	5.799	-	-	1	-
Savannah	5,860	-	2	-	-
Springfield	9,555	-	-	1	-
Union City	9,138	-	-	1	-
Winchester	5,305	-	-	1	-
Total	124,139	-	7	13	1
Average Population per Course		-	17,734	9,549	124,139

TABLE XLI (continued)

Cities	Population (1970)[a]	Type of Course			
		Municipal	Semiprivate[b]	Private	Other[c]
1,000-4,999					
Alamo	2,022	-	1	-	-
Ashland City	1,784	-	1	-	-
Bolivar	4,037	-	1	-	-
Brentwood	3,425	-	-	1	-
Camden	2,774	-	1	-	-
Carthage	2,487	-	1	-	-
Celina	1,228	1	-	-	-
Centerville	2,501	-	-	1	-
Church Hill	2,701	-	1	-	-
Clinton	4,943	-	1	-	-
Crossville	4,668	-	1	1	2
Dayton	4,089	-	-	1	-
Erin	1,156	-	-	1	-
Erwin	4,881	-	1	-	-
Etowah	3,562	-	1	1	-
Gainesboro	1,207	-	-	1	-
Hixson	4,000	-	1	1	-
Hohenwald	3,533	-	1	-	-
Kingston	4,319	-	2	-	-
Lafayette	1,900	-	1	-	-
Lexington	4,896	-	-	1	-
Livingston	2,817	-	1	-	-
Madisonville	2,757	-	-	1	-
McKenzie	4,580	-	-	1	-
Mt. Pleasant	2,945	-	-	1	-
Newbern	2,033	-	1	-	-
Oneida	2,480	-	1	-	-
Pigeon Forge	1,200	-	-	-	1
Rogersville	4,050	-	1	-	-
Selmer	2,971	-	1	-	-
Sewanee	2,000	-	-	-	1
Sharon	1,109	-	1	-	-
Signal Mt.	4,083	-	-	1	-
Somerville	1,820	-	-	1	-
Smithville	2,348	-	1	-	-
South Pittsburg	4,130	-	-	1	-
Sparta	4,510	-	1	-	-

TABLE XLI (continued)

Cities	Population (1970)[a]	Type of Course			
		Municipal	Semiprivate[b]	Private	Other[c]
Trenton	4,409	-	1	-	-
Waverly	3,595	-	1	-	-
Total	119,950	1	25	15	4
Average Population per Course		116,355	4,958	7,757	29,089
Under 1,000					
Afton	125	-	1	-	-
Allardt	556	-	-	1	-
Ardmore	610	-	1	-	-
Bean Station	100	-	-	1	-
Blountville	650	-	1	-	-
Chapel Hill	630	-	-	-	1
Copperhill	631	-	-	1	-
Fulton	85	-	-	1	-
Lobelville	706	-	-	1	-
New Market	750	-	1	-	-
Niota	679	-	1	-	-
Total	8,522	-	5	5	1
Average Population per Course			1,704	1,704	12,117
State Total	1,844,411	23	55	89	9
State Average Population per Course		80,812	33,535	20,724	204,935

[a]Population estimates for cities in Tennessee were taken from the 1970 Commercial Atlas and Marketing Guide (New York: Rand McNalley and Company), pp. 482-487.

[b]A semiprivate golf course was defined as a daily fee course open to the public but, unlike a municipal golf course, it was developed by an individual or groups of individuals who controlled the policies concerning its use.

[c]Other courses include courses operated by military bases, educational institutions and resort areas.

APPENDIX B

Schedule A

_____ Code_____
Enumerator Co. Facility No.

University of Tennessee
Department of Agricultural Economics
Knoxville, Tennessee

CHARACTERISTICS OF RECREATIONAL ASSOCIATION

1. Name of association_____

2. Ownership of association _____

3. Name of operator _____
   (a) Age _____ (b) Education _____.

4. Size of association
   (a) Years of operation _____ (b) Initial size of total complex _____acres (c) Initial size of golf course _____ acres _____holes (d) Present size of total complex _____ acres (e) Present size of golf course _____ acres _____ holes.

5. Golf course statistics
   (a) Par _____ (b) Length _____ yds. (c) Average size of greens _____ sq. ft. (d) Average size of tees _____ sq. ft. (e) Average width of fairways _____ yds. (f) Terrain _____ hilly _____ flat (g) No. of hazards _____ sand _____ water (h) Fairways tree-lined _____no. (i) Natural beauty _____.

6. Who initiated development of the association?

   (a) Individual or groups of individuals ( )
   (b) Community effort ( )
   (c) County ( )
   (d) State ( )
   (e) Federal ( )
   (f) Combination of above ( )
   (g) Explain:

   _____
   _____

7. Financing the association
   (a) How was the association financed?
      (1) Municipal funds ( ). Percent of total investment _____
      (2) Federal funds ( ). Percent of total investment _____
      Agency _____
      (3) Local bank ( ). Percent of total investment _____
      (4) Insurance company ( ). Percent of total investment _____
      (5) Private ( ). Percent of total investment _____
      (6) Combination of above _____
      _____
      _____

   (b) Financial arrangement
      (1) General obligation bonds ( );[1] Revenue bonds ( );[2]
      Amortilization of bonds _____
      _____
      (2) Interest rate _____ Length of repayment period _____

8. Structure of membership
   (a) Total no. of initial membership _____ present membership _____
   (b) Classes of present membership, their number and yearly rates
      (1) _____ No. _____ $_____
      (2) _____ No. _____ $_____
      (3) _____ No. _____ $_____
      (4) _____ No. _____ $_____
   (c) What was the initial cost of membership in the association? _____
      _____
      _____
   (d) Do you anticipate closing membership in the near future? Yes____
      No_____ If so, at what capacity_____ and when_____(number of years)

9. Decision-making process
   (a) Are major decisions based on a one member-one vote basis? Yes___
      No___
   (b) If not, explain. _____
      _____
   (c) Structure of leadership _____
      _____
      _____

10. Related supplementary or complementary recreational facilities and services owned by the association

(a) Fishing	( )	(e) Swimming	( )
(b) Boating	( )	(f) Tennis	( )
(c) Camping	( )	(g) Horse riding	( )
(d) Picnicking	( )	(h) Other	_____

---

[1]General obligation bonds are borrowed on the municipality's credit and taxing power. Such issues must be approved by the general public.

[2]Revenue bonds are payable from the net income received from the operation of the golf course. Such issues, depending upon the state statue, may or may not require approval by public referendum.

FACTORS AFFECTING USE OF FACILITIES

11. Green fees
    (a) Rates for 18 holes
        (1) Weekdays $_____
        (2) Late afternoon $_____
        (3) Weekends $_____
        (4) Junior golfers $_____
        (5) Feminine golfers $_____
    (b) Rates for 9 holes $_____
    (c) Upon what are green fees based?
        (1) General markup ( )
        (2) Comparative basis with other courses ( )
        (3) Other _____
    (d) Promotional rates
        (1) Were promotional rates used in the initial operation of the course? Yes_____ No_____. If so, at what rate? $_____
        (2) Do you have monthly or seasonal rates? Yes_____ No _____ If so, at what rate? $_____
        (3) Group rates $_____
        (4) Do you anticipate increasing green fees? Yes _____ No _____ If so, at what rate? $_____

12. Capacity and Patronage
    (a) What is the capacity of the golf course per day? _____; the swimming pool per day?_____; other facilities _____
    (b) What is the total number of patrons that used your golf course last year? _____ Other recreational facilities? _____
    (c) Of the above total how many of your golfing patrons used the course during the months of: Jan.-Mar. _____% Apr.-Sept._____% Oct.-Dec._____%
    (d) What percentage of your golfing patrons were members? _____ Nonmembers?_____ Weekend patrons?_____ Weekday patrons?_____
    (e) What percent of your patrons visit individually? _____ Couples? _____ in three? _____ four or more? _____
    (f) Of your total golfing patronage, where do they come from?
        (1) ____% _____ County (4) ____% _____ County
        (2) ____% _____ County (5) ____% _____ County
        (3) ____% _____ County (6) ____% _____ County
        (7) ____% _____County
    (g) How many golf tournaments do you sponsor a year? _____ Average no. of participants? _____ Percent of members participating?___
    (h) Which of the days of the week is the association open for business? _____ 7 days or _____M, _____T, _____W, _____Th, _____F, _____Sa, _____Su.
    (i) At what time of the year are you open? _____ Closed? _____ Total months per year?_____ At what time of day do you open? _____ Close? _____ Total hours per day? _____

13. Location
    (a) How many miles to the nearest city limits? _____ (b) Name of city _____ (c) Driving time to this city _____
    (d) Is the access road an all-weather road? Yes ____ No _____
    (e) Does the access road hamper use of facilities? Yes _____ No _____ (f) Distance access road is from public road _____

14. Competition
    (a) How many other privately owned golf courses are located in this county? _____
    (b) How many other private golf courses are located within 25 miles? _____
    (c) How many other public golf courses are located in this county? _____
    (d) How many other public golf courses are located within 25 miles? _____
    (e) What other types of recreational facilities are located within 25 miles? _____
    Do you consider these facilities as helping to increase or decrease your patronage? _____
    (f) How far are the nearest eating accommodations other than the concession stands? Miles _____ Driving time _____
    (g) Do you advertise? Yes____ No____ (List in order of importance only if answer is yes.)
    (1) Newspaper _____ (4) Outdoor sign _____
    (2) Radio _____ (5) Word of mouth _____
    (3) T.V. _____ (6) Other _____

15. Cost
    (a) How much do you estimate it will cost an average individual to visit your golf course for one day? $_____
    (b) How much in dollars do you estimate an individual will eat while visiting your golf course? $_____
    (c) How much do you estimate an average individual will have invested in supplies, equipment, etc., that visits your golf course? $_____
    (d) How much do you charge an average individual for the use of the related facilities (swimming, etc.) per visit? $_____
    (e) What cost factor (to the individual) do you feel most limits your total patronage?
    (1) Green fees ( )
    (2) Transportation costs ( )
    (3) Time expended ( )

INITIAL INVESTMENT

16. Construction Costs

Description of facilities by use	No.	Type	Capacity (sq.ft.)	Original cost or replacement cost[1]	Estimated life years
Housing facilities					
Club house					
Golf shop					
Lounge					
Snack bar					
Lodging					
Rest rooms					
Lockers					
Storage shed					
Other facilities					
Swimming pool					
Practice range					
Putting green					
Access road					
Parking lot					
Course construction					
Putting greens					
Temporary greens					
Fairways					
Hazards					
Sandtraps					
Waterholes					
Tees					
Ball-washers					
Shelters					
Benches					
Drinking water					
Irrigation equipment					
Pipe (lin. ft.)					
Pump					
Sprinklers					
Other (list)					
Added improvements[2] (list)					

[1] If can't get original cost, use replacement cost and designate as OC or RC.

[2] Added improvements since the initial development of facilities.

17. Equipment Costs

Item	No.	Model	Average hrs. used per week	Original or replacement cost	Estimated life years
Rental equipment					
Clubs					
Power cart					
Hand cart					
Tractors and trucks					
Farm-type tractor					
Golf course tractor					
Jeep or pick-up truck					
Tractor-front end loader					
Dump truck					
Mowing equipment					
Power green mower					
Power tee mower					
Power mower, 3 unit					
Rotary mower, 24" or 30"					
Rotary mower, 18" or 21"					
Power lawn mower					
Power vertical mower					
Fairway mower, 5 or 7 gang					
Rough mower, 5 gang					
Rotary type mower, 80" for leaf mulching					
Hand mowers					
Others (list)					
Maintenance equipment					
Power sprayer, 150 gal.					
Power sod cutter					
Power air broom					
Power aerifying					
Power thatch control					
Power shredder					
Power portable pump					
Power spike disc					
Electric hedge trimmer					
Power topdresser					
Fertilizer spreader, 8'					

(continued)

Item	No.	Model	Average hrs. used per week	Original or replacement cost	Estimated life years
Fertilizer spreader, 36'					
Proportioner					
Aerifying machine					
Hand lawn roller					
Hand leaf sweeper					
Steel drag mat					
Cyclone seeders					
Soil screen					
Others (list)					
Equipment and tools					
Hole cutter					
Hole cup					
Cup extractor					
Cup setter					
Poles and flags					
Tee markers					
Waste retainers					
Miscellaneous					

18. Land Costs
    (a) What was the initial cost of land per acre? $_____
    (b) What would you estimate the present market value of the land to be per acre? $_____
    (c) What would you estimate the present market value of the land adjacent to that of the association's to be per acre $_____
    (d) Does the association anticipate buying any land for expansion purposes? Yes_____ No_____

ANNUAL GROSS INCOME

19. (a) What would you estimate the annual gross income from Sept. 1, 1967, to Sept. 1, 1968 to be from:[1]

Source	Returns (dollars)	Total
Green fees		
Rental fees		
Clubs		
Power carts		

Source	Returns (dollars)	Total
Hand carts		
Lockers		
Golf lessons		
Driving range		
Golf shop		
Snack bar		
Annual gross income		

[1]If another date was used, record below.

(b) What is the most important limitation to your operation in terms of making profit?

(1) Location ( )
(2) Operating too small ( )
(3) Not enough customers ( )
(4) Labor costs too high ( )
(5) Maintenance costs excessive ( )
(6) Credit not readily available ( )
(7) Other (specify) _____

ANNUAL OPERATING COSTS

20. (a) Labor Costs

Job	No. of men	Wage rate	Avg. hrs./week		Total manhours
			Apr.-Sept.	Oct.-Mar.	
Course maintenance					
Mowing					
Fertilizing					
Cleaning up					
Other					
Managerial personnel					
Manager or pro					
Snack bar					
Swimming pool					
Other					
Total					

(b) Miscellaneous Costs

Type	Estimated costs	Total
Taxes		
Real estate		
Personal property		
Insurance		
Public liability		
Fire and windstorm		
Theft		
Workman compensation		
Other		
Advertising		
Retailers license		
Gasoline		
Fertilizer		
Repairs		
Total miscellaneous costs		

MANAGERIAL PRACTICES

21. Organizations which the course is a member _____
_____

22. Specific grass on greens (No.):
(a) Penncross bent_____
(b) Tifgreen bermuda_____
(c) Other_____

23. Specific grass on tees (No.): _____

24. Specific grass on fairway (No.): _____

25. Do you overseed your bermuda grass? Yes_____ No_____
(a) If you do, what is your seed mixture(s) (exact proportion per 1,000 sq. ft.)?_____
(b) What date of overseeding? _____
(c) What procedures do you employ to prepare the bermuda prior to overseeding (ex.: fertilization, N-P-K, mechanical, topdressing, fungicide, etc.)? _____
_____

26. What is your fertilizer and lime program for greens, tees, and fairways? _____
_____
_____

27. What are your major diseases in greens, tees, and fairways (ex.: dollar spot, brown patch, Spring dead spot, Helminthosporium, etc.)?

_____

_____

28. Insect control on greens, tees, and fairways?
    (a) Name insect _____
    (b) Chemical _____
    (c) Rate _____
    (d) Frequency applied _____

29. What is your watering program for greens, tees, fairways (frequency, season of year, weather conditions)? _____

_____

_____

30. What is your mowing program for greens, tees, fairways (frequency, height, clipping removal, etc.)? _____

_____

_____

CRANESHOT CREST

APPENDIX C

Schedule B

Code_____
Co. Facility No.

Date_____ Time_____ A.M._____ P.M._____ Weather_____

Dear Golfer:

This is a consumer study being conducted by the Management of this golf course and the Department of Agricultural Economics at the University of Tennessee. Information is needed concerning the general characteristics of our customers, how much visiting our golf course costs you, and how well you are satisfied with the golf course we have available. This information should help us to improve our golf course and services to you in the future.

In order to do this, we are asking you to take 3 to 5 minutes of your time to answer the following questions. Please answer all questions, but DO NOT SIGN THE QUESTIONNAIRE.

1. How often do you play this golf course per year?_____

2. How often do you play golf per year? _____

3. What is your average score? _____

4. What do you enjoy most about golfing? (Check one)

   a. Relaxation ( )
   b. Scenery ( )
   c. Exercise ( )
   d. Competition ( )
   e. Comradeship ( )

5. When do you do most of your golfing?

   a. Weekdays before 4:00 p.m. ( )
   b. Weekdays after 4:00 p.m. ( )
   c. Weekends.

6. Do you use this course only on weekends? Yes_____ No_____

7. At the present time what would you be doing if you were not playing golf?

   a. Working at job ( )
   b. Working at home ( )
   c. Other recreational activities ( )
   d. Just taking it easy ( )

8. Would you work more hours of gainful employment if you gave up golf? Yes_____ No_____

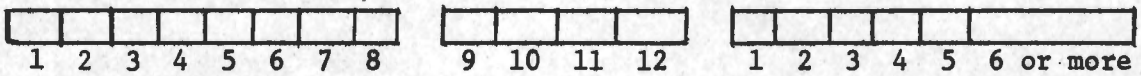
9. Please list:

   a. Occupation (What kind of work do you do?)

   _____

   b. Age_____ Sex: Male ( ) Female ( )

   c. Mark ONE square representing highest level of schooling completed.



Elementary Grades High School College

10. Are you ( ) Retired ( ) Student ( ) Housewife ( ) Employed fulltime ( ) Employed parttime ( ) Other _____

11. Are you paid by the hour ( ) or by salary ( )?

12. Check your approximate income before taxes last year.

( ) $3,000 or less	( ) $6,000	( ) $ 9,000	( ) $12,000
( ) $4,000	( ) $7,000	( ) $10,000	( ) $15,000
( ) $5,000	( ) $8,000	( ) $11,000	( ) $20,000 or over

13. How many are in your party? (a)_____ (b) Males_____ (c) Females____

14. How far do you live from this golf course? (a) ____ miles (b) Driving time _____hours _____minutes (c) city (please state name of nearest city or town if you live in a rural area)_____
    County _____ State _____

15. Did you have trouble getting to this golf course THE FIRST TIME? ___
    If yes, check the reason(s): ( ) bad road ( ) roads not marked
    ( ) no road signs ( ) other _____

16. How did you first hear about this golf course? Please check below:

( ) word of mouth ( ) radio ( ) other_____
( ) letter ( ) T.V. (please list)
( ) road signs ( ) newspaper

17. How much do you have invested in supplies and equipment necessary to participate in golf? _____

18. On the average, how much do you spend for food and drink per visit to this golf course? _____
Other golf courses? _____

19. Do you have membership at this golf course? Yes____ No____.
(a) Is it annual? Yes____ No____; semiannual? Yes____ No____; monthly? Yes____ No____. (b) If you are a member, do you consider the present recreational facilities adequate? Yes____ No____.

20. Have you played this golf course before? Yes____ No____. If yes, which of the following would you like to see changed or improved? That is, check your complaint.

( ) Too hilly
( ) Too flat
( ) Not enough water fountains
( ) Too expensive
( ) Manager's personality
( ) Fairway too rough
( ) No trees
( ) Too many trees
( ) Course too short
( ) Course too long
( ) No ball washing machines
( ) Other _____ (please list)
( ) Crowded
( ) No shelters
( ) Unsafe or dirty
( ) Fairways too narrow
( ) Insufficient sanitary facilities
( ) Poor quality or quantity of food
( ) Rough greens
( ) No sand traps
( ) Too many sand traps
( ) Cannot make appointment to play

21. How can we improve our facilities and services at this golf course for you?

_____
_____
_____
_____
(please make suggestions)

The Management and the Agricultural Economics Department at the University of Tennessee wish to thank you very much for your cooperation. This information should help us to improve our golf course and service to you in the future.

APPENDIX D

TABLE XLII

ESTIMATE OF PURCHASE PRICE, AVERAGE INVESTMENT, SALVAGE VALUE, ANNUAL DEPRECIATION, USEFUL LIFE AND ANNUAL REPAIR COSTS FOR SELECTED ITEMS OF EQUIPMENT USED IN THE OPERATION OF A GOLF COURSE

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Equipment Item	Description Unit	Purchase Price 1970 Dollars	Average Investment Dollars	Salvage Value Dollars	Annual Depreciation Dollars	Useful Life Years	Annual Repair Cost Based on Percent of Purchase Price	
							Percent	Dollar
Tractors and Trucks								
Farm type tractor	25-34 H.P.	2,975.00	1,636.25	297.50	178.50	15	10	297
Golf course tractor	17-24 H.P.	1,975.00	1,086.25	197.50	118.50	15	10	197
Pickup truck	1/2 ton	2,325.00	1,278.50	232.50	209.25	10	3	70
Dump truck	1-1/2 ton	4,000.00	2,200.00	400.00	240.00	15	5	200
Mowing Equipment								
Power green mower	22 in.	500.00	275.00	50.00	45.00	10	10	50
Power tee mower	26 in.	505.00	277.75	50.50	45.45	10	8	40
Rotary mower	20 in.	160.00	88.00	16.00	14.40	10	8	13
Rotary mower	21 in.	228.00	125.40	22.80	20.52	10	8	18
Rotary mower	60 in.	2,075.00	1,141.25	207.50	186.75	10	8	166
Fairway mower	3-gang	1,199.00	659.45	119.90	107.91	10	10	200
Fairway mower	5-gang	1,960.00	1,078.00	196.00	176.40	10	10	196
Fairway mower	7-gang	2,695.00	1,482.25	269.50	242.55	10	10	269
Bush hog	6 ft.	425.00	233.75	42.50	38.25	10	8	42
Power vertical mower	7 H.P.	669.00	367.95	66.90	60.21	10	10	54
Power lawn mower	22 in.	75.00	41.25	7.50	16.75	10	10	7

TABLE XLII (continued)

(1) Equipment Item	(2) Description Unit	(3) Purchase Price 1970 Dollars	(4) Average Investment Dollars	(5) Salvage Value Dollars	(6) Annual Depreciation Dollars	(7) Useful Life Years	(8) Annual Repair Cost Based on Percent of Purchase Price	
							Percent	Dollar
Maintenance Equipment								
Aerifiers-tractor drawn								
Grasslan	140 spoons	845.00	464.75	84.50	76.00	10	6	51
Tractor lift	140 spoons	540.00	297.00	54.00	48.60	10	6	32
Tractor lift	80 spoons	440.00	242.00	44.00	39.60	10	6	26
Aerifier	45 spoons	235.00	129.25	23.50	21.15	10	6	14
Aerifiers-self powered								
Vertifier	less core-catcher	1,119.00	615.45	111.90	110.71	10	6	67
Vertifier	with core-catcher	1,386.00	762.30	138.60	124.74	10	6	83
Junior	32-56 spoons	609.00	334.95	60.90	54.81	10	6	37
Estate	12-26 spoons	272.00	149.50	27.20	24.48	10	6	16
Power drag	9-1/2 ft.	457.00	251.35	45.70	41.13	10	5	23
Power sprayers								
Tractor drawn	150 gal.	1,225.00	673.75	122.50	110.25	10	5	61
Mounted-skid	150 gal.	1,146.00	630.30	114.60	103.14	10	5	57
Tractor drawn	300 gal.	1,350.00	742.50	135.00	121.50	10	5	67
Mounted-skid	300 gal.	1,130.00	621.50	113.00	101.70	10	5	56
Tractor drawn	103 gal.	142.50	78.37	14.25	12.82	10	5	7
Tractor drawn	150 gal.	162.50	89.37	16.25	14.62	10	5	8
Gas engine	25 gal.	453.50	240.42	45.35	40.81	10	5	23
Electric motor	25 gal.	494.50	271.97	49.45	44.50	10	5	25
Sod cutter	Power	75.00	41.25	7.50	6.75	10	5	4
Top dresser	Power	250.00	137.50	25.00	22.50	10	5	12

TABLE XLII (continued)

(1) Equipment Item	(2) Description Unit	(3) Purchase Price 1970 Dollars	(4) Average Investment Dollars	(5) Salvage Value Dollars	(6) Annual Depreciation Dollars	(7) Useful Life Years	(8) Annual Repair Cost Based on Percent of Purchase Price	
							Percent	Dollar
Thatch control	Power	500.00	275.00	50.00	45.00	10	5	25
Air broom	Power	200.00	110.00	20.00	18.00	10	5	10
Shredder	Power	435.00	239.25	43.50	39.15	10	5	22
Spike disc	Power	75.00	41.25	7.50	6.75	10	5	4
Fertilizer spreader	36 in.	75.00	41.25	7.50	6.75	10	5	4
Top dressing spreader	36 in.	160.00	88.00	16.00	14.40	10	5	8
Steel drag mat	5 ft.	20.00	11.00	2.00	1.80	10	3	1
Cyclone seeders	Hand	25.00	13.75	2.50	2.25	10	3	1
Soil screen	8 ft.	200.00	110.00	20.00	18.00	10	5	10
Lawn roller	Hand	15.00	8.25	1.50	2.90	5	3	1
Rental Equipment								
Electric carts								
Four wheel	36 volt, 25 AMP	1,650.00	907.50	165.00	148.50	10	12	198
Three wheel	36 volt, 25 AMP	1,250.00	687.50	125.00	112.50	10	12	150
Three wheel	24 volt, 20 AMP	820.00	451.00	82.00	73.80	10	12	98
Gas carts								
Four wheel	10 H.P.	1,625.00	893.75	162.50	146.25	10	12	195
Three wheel	6 H.P.	715.00	393.25	71.50	64.35	10	12	86
Hand carts	Pull	18.50	10.17	1.85	3.33	5	5	1
Golf clubs	Mixed set	150.00	82.50	15.00	27.00	5	3	4
Standard Equipment								
Tee bench	Wood-concrete	20.00	11.00	2.00	3.60	5		
Litter basket	Metal-14 in.	9.15	4.62	.10	1.81	5		

TABLE XLII (continued)

(1) Equipment Item	(2) Description Unit	(3) Purchase Price 1970 Dollars	(4) Average Investment Dollars	(5) Salvage Value Dollars	(6) Annual Depreciation Dollars	(7) Useful Life Years	(8) Annual Repair Cost Based on Percent of Purchase Price Percent	(8) Dollar
Ball washers	Aluminum	22.95	12.60	2.25	2.07	10		
Tee markets	Plastic-3-1/2 in.	1.35	.68	.01	1.34	1		
Spike cleaner	Aluminum	11.25	6.18	1.12	3.38	3		
Ball rack	Pipe	8.25	4.16	.08	1.63	5		
Tee plaque	Aluminum	9.50	4.80	.10	1.88	5		
Rule sign	Aluminum	4.50	2.27	.05	.89	5		
Cups	Plastic	2.75	1.39	.03	.54	5		
Sand rake	Aluminum	4.75	2.37	.05	.94	5		
Hole cutter	Aluminum	12.50	6.31	.12	2.48	5		
Cup setter	Aluminum	5.95	3.00	.06	1.17	5		
Flag pole	Aluminum	6.25	3.15	.06	2.06	3		
Flag	Cotton	1.15	.58	.01	1.14	1		

APPENDIX E

TABLE XLIII

MAINTENANCE COST PER GOLF HOLE, BY GEOGRAPHICAL DIVISIONS, FOR 50 COUNTRY CLUBS AS REPORTED BY THE NATIONAL GOLF FOUNDATION, 1966-67

Item	Dollars				
	Georgraphical Divisions				Overall Average
	East	South	Midwest	Far West	
Payroll	2,618	2,276	2,324	3,125	2,573
Payroll Taxes and Employee Benefits	337	212	234	338	286
Course Supplies and Contracts	692	610	614	593	635
Repairs to Equipment, Course, Buildings, Water and Drainage System, etc.	414	368	336	377	376
All Other Expenses	190	176	209	179	220
Total Maintenance Costs	4,237	3,675	3,687	4,653	4,060

Source: National Golf Foundation, Organizing and Operating Public Golf Courses (Chicago: 804 Merchandise Mart, 1967), Information Sheet, GC 4.

APPENDIX F

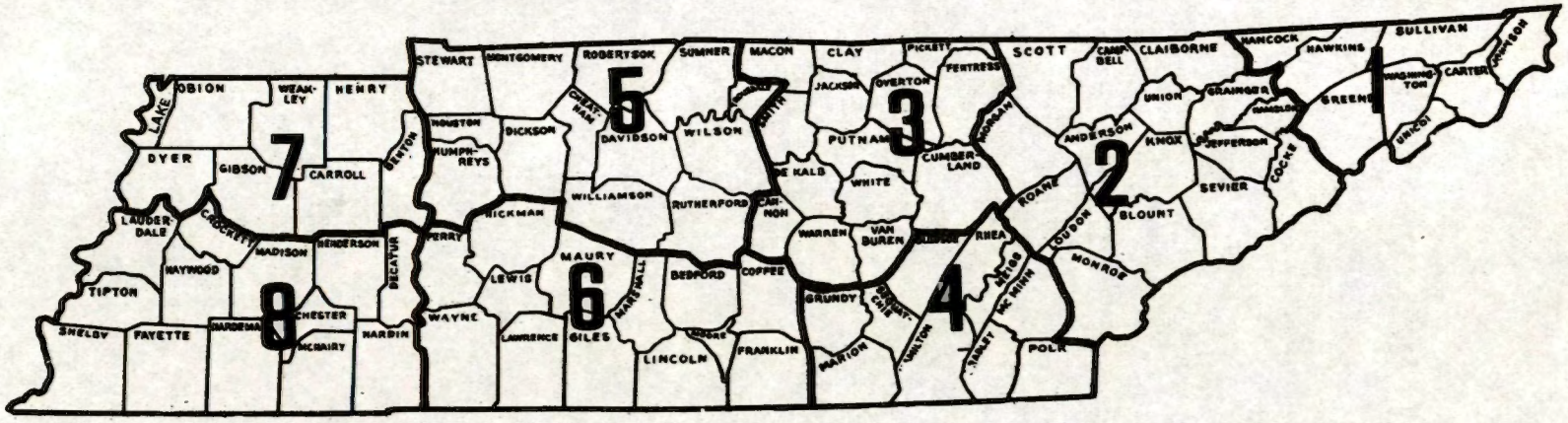


Figure 8. Recreation regions in Tennessee.

VITA

Julian Elery Holmes, son of Mr. and Mrs. Dewey E. Holmes, was born December 26, 1939, in Anniston, Alabama. His childhood years were spent on a cattle farm in Eastaboga, Alabama. He attended Eulaton Elementary School and was graduated from Walter Wellhorn High School, near Anniston, in 1957.

Julian continued his education by attending Auburn University, Auburn, Alabama, on an athletic scholarship. He obtained his Bachelor of Science degree in Agricultural Science in August of 1962. The following year, he accepted a research assistantship at Auburn University where he was awarded his Masters of Science degree in Agricultural Economics in March, 1965.

In January, 1966, he entered the University of Tennessee as a research assistant in Agricultural Economics. In 1971 he completed his requirements for the Doctor of Philosophy Degree from the University of Tennessee, Knoxville, Tennessee, with a major in Agricultural Economics.

He is married to the former Judy Louise Melton of Bynum, Alabama, and they are the parents of two girls.