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A PRELIMINARY ECONOMIC IMPACT FORECASTING MODEL FOR SHORT-TERM TOURISM EVENTS: A PRELIMINARY FRAMEWORK

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A PRELIMINARY ECONOMIC IMPACT FORECASTING MODEL
FOR SHORT-TERM TOURISM EVENTS:

A PRELIMINARY FRAMEWORK

BY

VIVIAN OKECHUKWU OKERE

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
IN
ECONOMICS

UNIVERSITY OF RHODE ISLAND

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ABSTRACT

The tourism industry is the fastest growing industry and the third largest employer in the State of Rhode Island. In terms of industrial output, tourism is currently estimated to generate about five percent of the State's gross domestic product.

Rhode Island attracts an estimated 5 to 8 million visitors annually. Among these are visitors to Rhode Island's short-term events. The sales impact that is generated in the business sector, the personal income and employment that is generated for individuals and households and the government revenue provided through taxes qualify it as a major economic force for the future. The measurement of such impacts is a challenge to researchers because of the diverse nature of the spending groups present and the fact that the services they demand are also demanded by the residents of the State.

Traditionally, economic impact studies have focused on estimating sales impacts of short-term tourism events. Predicting these impacts has not yet been attempted. This study attempts to make some headway in this direction by developing a framework for forecasting the impacts of short-term tourism events.

The economic impact of a short-term event can be described as the product of an average participant's expenditures and total participation in visitor-days. The forecasting framework developed in this study is composed of these two parts: a participation forecast and an expenditure forecast.

The expenditure forecast is based on a model which relates expenditure per person-day to numbers of persons per group and days per visitor at the event. This model is used to predict total expenditures. An allocation model is used to estimate expenditures on particular categories of event goods and services.

The participation forecast is a synthesis of empirical and expert judgmental prediction estimates. The empirical forecast is based on a model relating numbers of visitors per event to prices, weather and consumer perception. The empirical and judgment estimates of participation are weighted according to the proportions of total variance and added together. This synthesis is related to the Bayesian procedure of revising belief in the light of new information.

Some of the questions which remain unanswered by this research include: How to devise methods of measuring the reliability of subjective estimates by experts; How to construct a detailed typology of events for impact assessment; and How to incorporate event and site reputation into a dynamic forecasting model. Specific

answers to these questions could have a strong influence on future data collection and updating procedures. General answers will enable transference of the forecasting procedure to other states.

The preliminary model derived in this thesis should serve as a useful guide to researchers and potential sponsors of future Rhode Island events. It is hoped that the State of Rhode Island Department of Economic Development might use the results for logistic and planning purposes.

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CHAPTER I

INTRODUCTION

I.1. Historical Background of Tourism in Rhode Island

Prior to the 19th Century "travel" was undertaken by only a small, wealthy, and mostly landed elite. The reason for travel then was for education or business or some other official purpose. The vast majority hardly travelled beyond their villages or to the nearest market. For this majority, the idea of leisure and of a holiday in a modern sense did not exist. The modern dichotomy that divides life into work and leisure seemed artificial. Leisure in the 18th Century was an attribute of social class, not a division of the working day or of one's lifetime (Lundburg, 1972).

The word "tourism" did not appear in the English language until early in the 19th Century. When it did, it was closely associated with the idea of a voyage or peregrination or a circuit (Burkhart and Medlik, 1974). The years of the industrial revolution saw great development in the transportation and road network of the area. Travelling increased and people were able to visit distant places.

By the 20th Century tourism had become no longer the preserve of the wealthy and the leisured but rather a mass market. The 20th Century saw increasing leisure time, greater disposable income, higher educational level, large percentage of young adults and changing life styles which include travel as an important part of living.

Rhode Island's popularity with visitors has early beginnings. Giovanni da Verazzano, who in 1524 explored North America for the King of France, lingered a fortnight in the Narragansett Bay for rest and recreation. This has been said to constitute the first two weeks of vacation with pay on record. Consequently, some have claimed Rhode Island to be "America's First Vacation Land."

Formally founded in 1636 by settlers in search of religious freedom, the early economy of Rhode Island and the Providence Plantations was based on agriculture and then trade. Cargoes of rum, manufactured in Rhode Island from West Indian sugar and molasses, were exported to Africa and exchanged for slaves to be sold in the southern colonies and the West Indies. The years preceding the American revolution witnessed visits by the rich southern plantation owners and industrial corporations for leisure purposes. By this, the State's "First Resort" status is claimed.

The industrial revolution led to the construction of turnpikes, bridges, canals and railroads, opening the

interior of New England to farming and visitors. Farmers learned to sell articles and goods for cash and buy other merchandise needed. The buying of articles which were formerly produced locally led to the unemployment of wives and daughters. This, coupled with pest and disease problems, led to the desertion of farms by the younger generation to urban areas and the West. After the Civil War every state in the New England area, except Rhode Island and Connecticut, lost population through emigration. The mills in Rhode Island attracted many people who came to work at the mills (Tyrrell and Wallace, 1982). The first power loom in the country went into action at Peacedale in 1814; textile manufacturing soon replaced trade as the dominant economic force.

During the 1850s to 1920s, Newport became a favorite resort of the Vanderbilts, Wideners, and Astors who built opulent "summer cottages." Considered the best of the existing homes of the period, these have become a primary tourist attraction, i.e. Newport hosting more than 500,000 visitors annually. While the mansions now represent a very important focus of tourism in Rhode Island, they by no means exhaust the list of tourist opportunities in the area. Yacht races and regattas, boat shows, musical concerts, professional tennis, derbies, etc. Both in its early history and today, the waterfront has played a major

role in the growth and character not only of Newport but also of the State of Rhode Island entirely.

I.2. Meaning and Nature of Tourism

The International Association of Scientific Experts in Tourism (AIEST) define tourism as the sum of the phenomena and relationships arising from the travel and stay of non-residents provided they do not lead to permanent residency. The temporary short-term character of tourism distinguishes it from migration. In this sense, tourism represents a particular use of leisure and a particular form of recreation but does not include all uses of leisure nor all forms of recreation.

There is considerable difficulty in distinguishing between various forms of travellers. In this study, the main differences are and destination. The travellers of interest are the visitors to short-term tourism events. This has important implications for marketing in general and for promotion in particular as well as for planning.

Most traditional industries and economic production sectors are defined in terms of the process of production and/or the physical output (e.g., consumer electronics, automobiles, fishmeal and fish products). But tourism is a consumer oriented product defined in terms of the consumption of the product. Thus, most consumer products and services are to some degree a part of the tourism product. Those commonly identified with tourism include

hotels, restaurants, outdoor recreation facilities, entertainment, gifts, and souvenirs.

The definition of who is a tourist has both a conceptual and a practical interpretation. On the one hand, persons going about their normal work--while travelling in the strictest sense--are not tourists as far as the travel/tourism market is concerned. On the other hand, a family from Boston visiting Rhode Island for some form of vacation, sporting event and/or recreational purpose is easily classified as a tourist group. Yet, the latter class of persons still would not be included in most definitions such as the one used by the Bureau of Census because distance traveled did not exceed 100 miles. To further complicate the situation, some definitions of a tourist include only those on fully discretionary trips--sightseeing, visiting friends and relatives--but not those on business or attending conventions. Yet the latter often spend much of their time and money on discretionary leisure activities. These expenditures constitute important economic impacts to the State.

Accurate measures of the economic impacts of tourism events are important for planning, evaluating development strategies and gaining state and local support for specific events and activities. Direct impacts are defined to include jobs and wages created for community residents and profits received by local businesses.

Although revenues received by local, state, or federally owned recreation areas and facilities actually constitute governmental transfers between individuals, they are also counted as direct impacts because of their importance to governmental decision-making.

I.3. Tourism versus Recreation and Conservation

According to Thomas Burton and P.A. Noad (1968), recreation includes all pursuits other than those associated with work and necessary tasks of a personal and social nature that are undertaken by people in their leisure or uncommitted time. It therefore includes only activities that are chosen freely.

Recreation includes such terms as: activity engaged in during leisure, activity for pleasure and enjoyment, or activity that enriches the lives of people. They vary from those that are resource-oriented (extensive parks that accept a minimum of people-use) to those that are user-oriented (marinas, beaches, playgrounds, and picnic areas [Gunn, 1979]).

Conservation, on the other hand, implies efficient use of resources over time. Its emphasis is hinged on the protection of natural resource characteristics, preventing habitat destruction, reduction of species and natural resource pollution (Darnell, 1973). The idea that conservation is therefore the preservation of the cultural heritage is popularly supported today. Consequently,

conservation could be said to imply the protection and restoration of non-reproducible works of man or nature.

A synthesis of the ideologies in recreation and conservation are essential to tourism. Budowski (1973) suggested that one could build the case not only for a symbiotic but even a synergistic relationship between the three ideologies of tourism, recreation and conservation. Much of the participation in recreation would not take place if it were not for the components of tourism. Furthermore, the definitions of recreation include the elements of conservation such as aesthetics, resource protection, environmental education and heritage interpretations.

Tourism, therefore, does not only embrace the commercialization of recreation and conservation, it is also stronger and more penetrating because of the conservation and recreation components that make it up.

A tourist attraction in its raw state provides an input which, if processed, produces something of value. For example, the availability of open water areas makes it possible to sail. Also, land providing multiple products and services is used as space and support for the celebration of Christmas events as an example. Even though these natural resources may not be engaged in a measurable productive use, their presence act as a stimulant to the visiting public. Randall (1980) suggests that unknown

"things" for which no uses have been found are not resources. With changes in information, technology and relative scarcity the possibility exists that a valuable resource could be developed from what was previously considered of no use.

Resources would be of no value if they were not potentially used in any process. Hence, agricultural production requires land, water and air; industrial processes use land for space and sport and tourism events use land, air and water as raw materials as well. All these uses imply a wise allocation of time, space and resources for the present and the future so as to maximize net benefits from resource uses. The difference between the use of the resources is a consequence of the unique ways in which the service industry uses resources. There is much more variability over short periods of time and use is more likely to be non-consumptive in the usual sense. The long run depletion or over-use of these resources could result in diminished productive capacity of an event and subsequently affect the growth of the economy. A resource oriented industry such as tourism and its events could play an important role in the growth of the economy. Rhode Island is one state where the growth potential is particularly great in 1987.

Therefore, the purpose of study is to develop an economic impact forecasting technique for short-term

tourism events in the State of Rhode Island toward the long-term goal of optimal resource allocation. The development of an event impact forecasting model, integrating trends in tourism climate with specific event characteristics will serve as a basis for planning guidelines in the future.

CHAPTER II

THE RESOURCE BASE OF TOURISM

II.1. Growth of Tourism in the USA

Since World War II, Americans have been heading for the outdoors at an ever-increasing pace. According to the 1962 Outdoor Recreation Resources Review Commission (ORRRC) studies, the demand for outdoor recreation is "surging" regardless of the measure used. Moreover, this trend shows no sign of slackening. Factors which appear to affect participation in a positive manner, such as population, income and leisure time are expected to continue their own growth in the future. Based upon these projected growth trends, the ORRRC studies forecast that the aggregate demand for outdoor recreation will nearly triple by the year 2000, while the United States population is due to double.

The "Travel" industry is defined as those businesses that provide goods and services to the travellers at the retail level. This industry serves an average of 8 million travellers a day. In 1982, U.S. residents and foreign visitors spent \$191 billion travelling in America (report by U.S.T.A., Impact of Travel on State Economies, Washington, DC). In 1981, Americans spent \$179 billion in

the U.S. on travel (USTA, 1981). These expenditures reportedly generated 4.7 million jobs paying \$43 billion in wages and salaries (USTA, 1981). In fact, the travel and tourism industry is one of the three largest employers in forty states. Jobs directly generated by this industry exceeded those in all other private industries in thirteen states. Also reported is that the hotel industry ranks first as an employer nationwide. Entertainment and recreation accounted for 11.4 percent of the total generated employment. Although a dollar spent on travel generates different amounts of payroll income in different sectors of the travel industry, depending on the labor content of the service and the wage structure, an average dollar generated 21.7 cents in wage and salary income during 1981 (USTA).

Travel expenditures produce sales and income tax revenues for federal, state and local governments. An analysis of the distribution of tax receipts in 1981 suggests that the state governments are more aggressive than the federal or local governments in taxing travel related activities. On average, each dollar of travel spending generated 6.0 cents in federal tax revenue, 3.7 cents in state tax revenue and 1.1 cents in local tax receipts for a total of 10.8 cents.

Studies in 1987 reveal that travel industry dollar receipts grew at an annual rate of 5.9 percent in the

first half of 1986 (U.S. Travel Data Center, 1987). This figure was lower than the three previous years' rates of growth and considerably below the long-term rate of growth of 9.5 percent over the last decade. During the past two years industry receipts grew at an almost identical rate as the Gross National Product in current dollars. The real travel industry receipts rose 3.6 percent in 1986 above the long term rate of 3.0 percent. Travel industry employment was up 4 percent, just below the long term rate of growth of 4.5 percent. The travel industry provided 336,000 new jobs in the first half of 1986, nearly 13 percent of all new jobs created by the entire economy. (See Table II.1.)

II.2. The Resources of Rhode Island

The tourism industry is an important sector to the growth and development of Rhode Island. A study on Economic Impact of Travel on State Economies conducted by the Travel Industry Association of America (1981) reported that receipts from travel for Rhode Island were \$345 million. This created 10.56 thousand jobs and \$83 million in payroll. In terms of tax revenue, the Rhode Island travel industry generated \$45 million--\$23 million for the Federal government, \$18 million for the State, and \$4 million for local governments. The statistics reveal that tourism-related establishments (computed from eating and drinking places, hotels and lodging places, amusement and

TABLE II.1 U.S. TRAVEL INDUSTRY TRENDS*
(Percent Change from Previous Year)

Year	Current Travel Industry Sales	Real Travel Industry Sales	Travel Industry Employment
Percent change from previous year			
1977	10.5	3.4	6.4
1978	12.1	4.6	7.1
1979	16.1	5.5	5.4
1980	10.9	1.2	3.0
1981	11.0	1.7	2.7
1982	4.8	-0.4	1.5
1983	9.0	4.6	3.8
1984	8.7	3.5	6.1
1985	6.1	2.4	5.8
1986	<u>5.9</u>	<u>3.6</u>	<u>4.1</u>
(first half)			
Average	9.5	3.0	4.6

*Includes commercial lodging places, eating and drinking places, air and rail transportation companies.

Source: U.S. Travel Data Center

recreation services, and gasoline services) have the greatest potential for growth. In fact, as an employer the travel and tourism industry ranks third in the state. Studies on Southern New England have shown that during the six years from 1976 to 1982, the coastal counties of Rhode Island (precisely Newport and Washington Counties) have shown the fastest rate of growth in employment in hotels, motels, and eating and drinking places.

Thus, the recreation and tourism-related statistics of Rhode Island seem impressive in relative measure and growth compared to other establishments. But these statistics are small when one compares them with those of other states in the U.S. The average state enjoyed \$3.5 billion in U.S. travel spending. Sixteen states exceeded this while 41 states crossed the billion dollar mark. The Rhode Island figure of \$366 million was the lowest. In employment, Rhode Island has the fewest travel generated jobs. Only six states showed fewer than 20,000 while Rhode Island showed a little over 10,000. The travel and tourism generated payroll of South Dakota and Rhode Island indicated less than 100 million, the lowest among the 50 states. In the tax revenues generated from travel and tourism Rhode Island ranked among the lowest three states.

The U.S. statistics on travel, tourism and recreation for Rhode Island is the lowest and at the bottom of the list of states. There are a number of reasons why this

ranking is not a true representation of Rhode Island's travel and tourism industry. First, even though Rhode Island is the smallest state in the Union, it has an edge over several other New England states. Rhode Island is the heart of the New England market. Sixty-five percent of New England's total population (8,050,000) is located within 75 miles of Providence. This population could compare to those of Chicago or the Los Angeles-Long Beach Metropolitan area, the two largest metropolitan areas west of the Hudson River.

Because of the relative geographic position of Providence in the New England area, many tourists to Rhode Island are day-trippers. Expenditures associated with these day trips are not counted by the U.S. Department of Commerce in its estimation of sales impact from the travel-tourism industry. In addition, the U.S. Department of Commerce defines tourism as traveling out of one's domicile for 100 miles or more. Expenditures incurred at less than 100 miles distance from home were therefore not regarded as tourism related. As a result, the figure of \$366 million for 1981 underestimates the size of the industry.

Studies by Tyrrell in 1987 reveal that the tourism industry generated \$500 million dollars in revenue in 1981. The estimate for 1986 is in excess of \$1 billion. These figures may still be below the national average but

they show a much larger industry than was otherwise measured. Furthermore, growth of this industry since 1982 has been estimated to be in excess of 11 percent per year. Accordingly the industry could double in size in six years (Tyrrell, 1985).

In addition to its historical sites and mansions, Rhode Island is generously endowed with one of the most popular recreation products--ocean beaches. The state is commonly known as the Ocean State. Compared to the state's 136 miles of land boundaries, Rhode Island has 420 miles of saltwater coastline. The beaches in Rhode Island, especially those along the south shoreline (Newport and Washington counties), are ranked among the best in the nation and local communities serve as resort areas for the entire Northeast. All these factors indicate a substantial and growing importance of the State's travel and tourism industry.

II.3. Justification for and Significance of the Study

Past studies have estimated the benefits that can be derived from tourism events. Studies by Della-Bitta et al. (1976) on the "Tall Ships" and Tyrrell (1982) on the major events at the Newport Yachting Center have shown considerable economic significance of tourism to Rhode Island. Every sector of the economy is affected through the purchase of goods and services by tourists and sales by industries serving tourists. Benefits are received

directly and indirectly. Direct economic impacts are caused by expenditures by event participants. Indirect impacts are brought about by circulation and respending of these direct benefits. The sum of the direct and indirect ("multiplier") effects of visitor spending determine the total economic impact of tourism.

Evidence suggests that there is a steady and relatively rapid increase in demand for travel, tourism and outdoor recreation. This has brought the topic of outdoor recreation into the arena of public policy more and more frequently in recent years (Kalter and Gosse, 1985). With increasing pressure being placed on the available supply of recreational opportunities, numerous problems for public policy have arisen. The basic issue of the appropriate public-private mix on the supply side, as well as more specific questions relating to governmental planning, investment and management, have created a growing need for data and analytical tools for decision making. As a consequence, Kalter and Gosse reported that research on many aspects of outdoor recreation and tourism related activities has been requested both by governmental agencies, at all levels, and by those portions of the private sector concerned with the tourism industry.

A major concern for planners is the number of visitors to tourism events as well as permanent

attractions. This concern can be translated into specific needs for demand information. Quantification of the demand functions for tourism can provide estimates of the demand elasticities with respect to price and other policy variables. These are important for allocation plans and decisions on reimbursement. Cross elasticities of demand or the degree of complementarity and substitutability among various alternative activities may also have important effects on the future demand situation. Three specific needs for this information can be identified. First, the public planning and budgetary allocation process requires knowledge of the demand for specific events and attractions in order to efficiently allocate scarce natural resources. The magnitude and spatial distribution of future demand are significant for private investment and public policy decisions which will guide resource allocation.

Related to question of demand is the issue of reimbursement. To the extent that tourists pay for the use of public services and natural resources, public investment is reimbursed. Tourists are major users of public services, whether visiting a permanent attraction or a short-term event. Public policy decisions have traditionally made many recreation-related services virtually free goods. In some cases this has led to an excess demand for outdoor recreation resources which has,

in turn, called for inefficient increases in supply. Although there are strong arguments against reimbursement (see Stoevener and Brown, 1967; Krutilla, 1966), they are not conclusive nor. The issues will be discussed at a later point in this study.

Secondly, tourism is becoming an increasingly important element in regional economic development. The secondary or multiplier effects of tourism investment can have important implications for regional development policies. Only with increased information on demand, its sources and the spending characteristics associated with it, can the various levels of government take maximum advantage of the tourism "export" component in area economic growth plans.

Thirdly, tourism as a consumer good requires additional factors of production if it is to be provided. Besides the use of natural resources and public services, demand for visits to tourism events and attractions creates a derived demand for certain additional human and capital resources. If future resource needs for short-term events are to be projected, some measure of demand for tourism products and services must be available.

In this thesis, the focus is on measuring visits demanded for short-term tourism events. Because this type of endeavor has not been previously undertaken, neither a set of answers to the above questions and concerns nor a

large amount of data directly related to their solution are available. A preliminary prediction model for economic impact caused by short-term marine tourism events is presented for planning future events. Academic achievements and results are considered to be superior to the practical model. It is anticipated that future models will be well received. For instance, promoters and/or sponsoring agencies will be interested to learn of their anticipated audience in their future displays during events. Public officials will be able to judge the expected value of their investments to the state. Even sponsors who did not make any sales to the participating public will want to know the success of their public relations campaign. Also, forecasting the number of participants would assist the hosts of events in making adequate plans to provide required facilities within a locality.

Even though benefits, in terms of revenues received from sales of goods and services, are generated from short-term tourism events, negative impacts are also created from such events. Some of the negative impacts which could occur from events include pollution and erosion of non-replenishable works of man and nature, congestion of traffic and crime. Good planning aided by adequate projections for an event is, therefore, needed so as to maximize the next benefits after these losses or

costs are accounted for. However, the issue being addressed in this study is an estimation of the positive aspects of economic impact. Hence, it is left to future researchers to develop the more comprehensive model.

CHAPTER III

MARINE RESOURCES AND THE MARKET FOR MARINE-RELATED TOURISM IN RHODE ISLAND

III.1 Introduction

The State of Rhode Island is endowed with remarkable 420 miles of salt water ocean coastline, which is valued in a great variety of uses, compared to the 136 miles of land boundaries. A major portion of the State's population earns its living either directly from the sea or because the coastline provides the harbors from which to fish, trade and ship. The state's coastline also serves as a major attraction of marine-oriented recreation and tourism. This section, therefore, examines the supply of marine services and the market for marine tourism events in Rhode Island.

III.2 The Supply of Marine Services

There are eighteen yacht harbors and basins in Rhode Island waters (see Figure III.1). Based on the count of number of available spaces by towns in Rhode Island, it has been estimated that there are 11,384 slips and moorings in the state's coastal waters. This figure is obtained from estimates provided by International Marina Institute (IMI) (3/17/87), and Tyrrell and Manheim

ANCHORAGES, STATE GUEST MOORINGS MARINAS, YACHT CLUBS IN RHODE ISLAND WATERS

Figure III.1 Yacht harbors and basins

Source: 1987/88 Boating and Fishing Guide of Rhode Island

(personal communications, 1987). It has also been estimated that about 10% of these (1,060) are transient ships and moorings (Manheim, 1987). The latter figure was based on IMI's 1987 estimates plus by information obtained from the owners or managers of marinas in the state. A 1983 study of the boating industry and the economy of the State of Rhode Island (Rorholm and Burrage, 1983) claimed that "there is no market, within reasonable shipping distance, for more recreational boats than can be built by the existing firms in Rhode Island. Enticing new firms to the area would most likely lead to more firms competing for the same market share. There are some exceptions to this, for Rhode Island boat builders do not all compete in the same market, but generally, the state's boat building physical plant is not fully utilized." Hence, there is a supply of boats as well as marina services in the state.

III.3 The Market for Marine Tourism

Based on the Rhode Island tourism statistics and previous boating events studied, the market for Rhode Island's marine-oriented tourist events and attractions is concentrated along the northeastern region of the U.S. In Figure III.2, the map of the northeast U.S. is presented with the county borders shown. The coastal counties of the region have been serially numbered starting from Washington County (1) in Maine to St. Mary's County (54)

Figure III.2 The Northeast Region of the United States of America with coastal counties numbered serially.

in Maryland. The estimated number of salt water ships and moorings by towns in Rhode Island and counties in the other states of the Northeast are presented in Table III.1. These, together with state statistics on boats registered with the U.S. Coast Guard, provide a rough guide to the distribution of the boating public in the northeastern U.S. Since the number of available spaces for boats stored on land and ramps is not accounted for here, the total market for boating tourism is underestimated. The number of coastal slips and moorings per coastal population, statewide Coast Guard registered boats per capita and statewide boats per slips and moorings are presented in Table III.2.

An analysis of the second and third columns of Table III.2 reveals two important market features. First, the demand (column 3) for boating activities exceeds the supply (column 2) of marine facilities (i.e., slips and moorings) in all northeastern states except in Rhode Island. Also, the State of Rhode Island has the highest proportion of coastal slips and moorings in the area. Thus, the coastal marina resources of Rhode Island could be said to be most suited for marine oriented activities in the region.

Secondly, the proportion of statewide boats per slips and moorings (see column 4) shows that there is a local demand for marina facilities by the Rhode Island boating

Table III.1 Number of Slips, Moorings, Boats and Population in the Northeastern U.S.

STATE	COUNTY	1986 SLIPS & MOORINGS ^a	1983 C.G. REG. BOATS ^b	1984/82 POPULATION ^c
MAINE				
	1) Washington	59		35600
	2) Hancock	1106		44400
	3) Waldo	117		30000
	4) Knox	631		34200
	5) Lincoln	509		28000
	6) Sagadahoc	144		31900
	7) Cumberland	1888		223900
	8) York	897		153100
	Total Coastal Counties	5541		581100
	Unaccounted Slips & Moor.	21		
	State Total	5562	116419	1165800
NEW HAMPSHIRE				
	9) Strafford	97		89900
	10) Rockingham	304		212600
	Total Coastal Counties	401		302500
	Unaccounted Slips & Moor.	65		
	State Total	5562	6579	982400
MASSACHUSETTS				
	11) Essex	5525		643300
	12) Middlesex	160		361700
	13) Suffolk	2308		631700
	14) Norfolk	1809		609400
	15) Plymouth	3261		432300
	16) Bristol	974		489500
	17) Barnstable	5473		172800
	18) Dukes	1461		10300
	19) Nantucket	463		5800
	Total Coastal Counties	21434		4356800
	Unaccounted slips & moor.	575		
	State Total	22009	16137	5807900
RHODE ISLAND				
	20) Providence Co.	140		
	20-1) E. Providence	238		51301

POP. 1982

Table III.1, Cont.

STATE	COUNTY	1986 SLIPS & MOORINGS ^a	1983 C.G. REG. BOATS ^b	1984/82 POPULATION ^c
	21) Bristol Co.	2108		
	21-2) Barrington	788		16074
	21-3) Warren	201		10764
	21-4) Bristol	997		20085
	22) Newport Co.	2354		
	22-5) Portsmouth	637		14759
	22-6) Tiverton	82		13788
	22-7) Little Compton	210		3147
	22-8) Middletown	0		17305
	22-9) Newport	688		29910
	22-10) Jamestown	211		4347
	23) Kent Co.	2582		
	23-11) Warwick	1810		86832
	23-12) E. Greenwich	1828		10134
	24) Washington Co.	2889		
	24-13) N. Kingstown	549		22664
	24-14) S. Kingstown	337		20956
	24-15) Narragansett	1775		12226
	24-16) Charlestown	236		5087
	24-17) Westerly	397		18753
	24-18) Block Island	400		667
	Total by County	10073		358799
	Unaccounted Slips & Moor.	1311		
	State Total	11384	23876	953772
CONNECTICUT				
	25) New London	2008		248800
	26) Middlesex	1648		135100
	27) New Haven	1459		769500
	28) Fairfield	1081		815100
	Total Coastal Counties	6196		1968500
	Unaccounted Slips & Moor.	11067		
	State Total	17263	66881	3152800
NEW YORK				
	29) New York	8669	66881	6127700
	Unaccounted Slips & Moor.	42631		
	State Total	51300	327700	17915500

Table III.1, Cont.

STATE	COUNTY	1986 SLIPS & MOORINGS ^a	1983 C.G. REG. BOATS ^b	1984/82 POPULATION ^c
NEW JERSEY				
	30) Bergen	230		836100
	31) Essex	132		820800
	32) Middlesex	800		611200
	33) Monmouth	4215		532800
	34) Ocean	7503		399400
	35) Burlington	259		387700
	36) Atlantic	2596		207900
	37) Cape May	3064		94900
	38) Cumberland	502		137600
	39) Salem	160		67500
	Total Coastal Counties	19461		4095900
	Unaccounted Slips & Moor.	8794		
	State Total	28255		7545800
DELAWARE				
	40) New Castle	130		403100
	41) Kent	100		105000
	42) Sussex	3861		106900
	Total Coastal Counties	4091		
	Unaccounted Slips & Moor.	0		
	State Total	4091	36167	615000
MARYLAND				
	43) Cecil			65000
	44) Kent			16900
	45) Queen Annes			29000
	46) Talbot			26700
	47) Dorchester			30700
	48) Somerset			19200
	49) Worcester			34200
	50) Harford			157700
	51) Baltimore			667600
	52) Anne Arundel			406200
	53) Calvert			41000
	54) St Mary			66000
				1560200
	Total	15000	142515	3631200

Table III.1, Cont.

	1986 SLIPS & MOORINGS ^a	1983 C.G. REG. BOATS ^b	1984/82 POPULATION ^c
Northeast Totals			
Coastal Counties ^e	90866		19966499
Unaccounted Slips & Moorings	79464		
Regional Total	155330	877126	34224372

Sources:

^a1986 estimates of slips and moorings provided by International Marina Institute. Unaccounted slips and moorings are in non-coastal counties. Rhode Island town estimates are for 1984 and sums exceed 1986 county estimates. Differences cannot be traced.

^bU.S. Coast Guard.

^c1984 population estimates for Northeast counties from 1986 Rand McNally Commercial Atlas and Marketing Guide. 1982 population estimates for Rhode Island towns was obtained from Rhode Island Basic Economic Statistics 1985-86.

^dEstimate obtained from Rorholm per personal communications.

^eIncludes estimate for Maryland.

Table III.2 Indicators of Northeastern Boating Market by State

State	Coastal Slips & Moorings	Statewide Coast Guard Registered Boats per Capita	Statewide Boats per Slips and Moorings
MAINE	0.0095	0.100	20.93
NEW HAMPSHIRE	0.0013	0.007	14.12
MASSACHUSETTS	0.0050	0.028	7.32
RHODE ISLAND	0.0281	0.025	2.10
CONNECTICUT	0.003	0.021	3.87
NEW YORK	0.0014	0.018	6.39
NEW JERSEY	0.0048	0.059	4.90
DELAWARE	0.0067	0.018	8.84
MARYLAND	0.0096	0.039	9.50
NORTHEAST REGION	0.0050	0.026	5.65

public. In other words, there are more available marina spaces for boats owned by Rhode Island residents.

The general public also presents a market for short-term marine-related tourism events. Using the 1980 census, Ottersbach (1985) showed how the levels of education, occupation and income influenced travel. He revealed that college educated adults in the United States constitute about 32 percent of the population and almost 12 percent of U.S. adults earn over \$50,000 a year. Also, 14.3 percent of the U.S. adults have either professional, executive, or managerial positions. These three demographic factors are believed to affect the travel and tourism industry. Figures III.3 to III.5 show the distribution of these categories by regions.

Table III.3 shows the origins of the general public, the household per capita income and the percentage of the

Figure III.3 Travel - A luxury influenced by income.
\$50,000+HHI
(11.8% U.S. Adults)

Source: Travel Patterns: Insights from A Regional
Perspective, by Ottersbach (1985).

Figure III.4 Education: % college-educated adults (25 years old)

Source: Travel Patterns: Insight from a Regional Perspective, by Ottersbach (1985).

Figure III.5 Professional/Executive/Managerial

Source: Travel Patterns: Insights from a Regional Perspective, by Ottersbach (1985).

population completing twelve or sixteen years of education in the region. Population estimates are highest in New York, Pennsylvania, New Jersey and Massachusetts, and Connecticut and Maryland are next in line of importance. Household per capita income is highest in Washington, DC, Connecticut, Maryland, New Jersey and Massachusetts, and these are correlated with the levels of education. These demographic features of the region are consistent with the rates of visitation observed from previously studied boating events. Such information could be used in marketing short-term tourism events.

Table III.3 Demographic Characteristics of the General Public in the Northeastern U.S. by State

State	Population	Per Capita Income	Education % Completing	
			12 years	16 years
MAINE	1,165,800	9,303	68.7	14.4
NEW HAMPSHIRE	982,400	11,365	72.3	18.3
VERMONT	533,400	9,350	71.0	19.0
MASSACHUSETTS	5,807,900	12,277	72.2	20.0
RHODE ISLAND	963,000	10,976	61.1	15.4
CONNECTICUT	3,152,800	14,096	70.3	20.7
NEW YORK	17,915,500	11,723	66.3	17.9
NEW JERSEY	7,545,800	13,199	67.4	18.3
DELAWARE	615,000	11,215	68.6	17.5
PENNSYLVANIA	11,965,400	10,572	64.7	13.6
MARYLAND	3,631,200	13,100	67.4	20.4
WASHINGTON DC	618,100	14,176	67.1	27.5

Sources:

- a & b: Rand McNally Commercial Atlas and Marketing Guide, 1986.
- c: County and City Data Book: A Statistical Abstract Supplement 1983, 10th Edition, U.S. Bureau of the Census.

Since boating activities form an important sector of the tourism industry, the best route to economic development through marine recreational tourism requires the support of the state government, not only to the firms that produce and/or sell boats and their accessories, but also to the sponsors of short-term tourism events herein referred to as boating events. Consequently, the image of the state could be portrayed as an "ideal boating center" which accordingly would attract service and product industries as well as visitors primarily from the northeastern U.S. to Rhode Island short-term boating events.

III.4 Marine Short-Term Tourism Events

There are numerous and different types of short-term tourism events in Rhode Island. The calendar year for these events runs from April through December with the majority of the events held between May and September. A good number of these events are directly or indirectly related to marine recreation or the use of marine sites. Some of these events last a few hours, others a few days, and a few up to a month. Based on the Calendar of Events given in the 1987 Visitor Guide of Rhode Island, 325 events fall into this category. Table III.4 shows when these events occur over the year and how many events are marine-related.

Table III.4 Total Number of Events in 1987, by months

Month	Total Number of Events	Number of Marine Related Events
April	33	1
May	60	10
June	47	16
July	54	14
August	46	18
September	34	10
October	25	2
November	7	0
December	<u>19</u>	<u>0</u>
Totals	325	17 (22%)

Source: 1987 Visitor Guide of Rhode Island.

Tourist events like the America's Cup Races are made up of several preliminary or elimination series. According to our definition of an event, each of these preliminary series would be considered short-term events even though they complement the final America's cup competition. Therefore, total economic impact from such segmented events is expected to be the sum of all the impacts from different series.

The number of events presented in Table III.4 reveals that there are seventy-one (approximately 22%) marine-related events in Rhode Island in 1987. A marine-related event could be described as an event that uses the significant, if not necessary, marine facilities of the state as input. This would include events such as concerts on harbor centers in Newport and Block Island, fishing tournaments like the tuna and bass fishing

tournaments, boat shows and boat races. Events like the 1987 Jazz Festival held at Fort Adams State Park in Newport may not be considered marine-related events because they do not utilize any marine facilities as a significant input. The attractiveness of the Jazz Festival to visitors would only be slightly diminished if the site were changed.

Marine-related events in Rhode Island constitute about 22 percent of the total number of events in 1987. These events are considered to be very important not only because of the amount of revenue generated, but also because of their considerable influence on the reputation of Rhode Island as the "Ocean State" among potential tourists. Hence, the focus in this thesis is on these marine-related events, especially the boating events.

III.5 Selected Marine Tourism Event Case Studies

Short-term tourism events differ in type, organization, duration, and period in which the event takes place. This section discusses the major characteristics of several previously studied events, some of which are used in the development of the event impact forecasting model. They are characteristic of the short-term marine-related events which take place in Rhode Island each year.

III.5.1 Major Boating Events at the Newport Yachting Center in 1982

In 1982, the Newport Yachting Center (NYC) hosted the Wooden Boat Show (WBS) August 19-22, the Newport International Sailboat Show (NISS) September 9-12, the New England Power Boat Show (PBS) September 23-26, and six manufacturers' Rendezvous events. The events attracted groups of boaters, sightseers, marine-products exhibitions and tradesmen to Newport for one to four days of the events' duration. Goods and services were sold to the visitors and boaters by the NYC and its commercial guests. Also, considerable sales were made by local Newport businessmen due to these NYC activities.

The NISS is the premier boating attraction of the Yachting Center. It has a well-established fifteen-year reputation and in 1982, 330 exhibiting companies and 17,000 trade patrons and public visitors attended the show. These visitors came in groups of an average size of 2.5 persons and stayed an average of 1.2 days at the show.

The WBS was the first of its kind on the East Coast when it was sponsored in 1981 by the Yachting Center. In 1982, this WBS attracted 70 exhibiting companies and 12,000 trade patrons and public visitors. The group sizes averaged 2.6 persons and they stayed an average of 1.4 days at the show.

The NISS and WBS visitors came from 23 states in the United States and from Canada and four other countries.

Visitors heard about these boat shows from a variety of media and other sources such as boat dealers' references. (See Tables III.5 and III.6.) For example, the NISS visitors interviewed revealed that 39 percent "came before," 22 percent heard about the show by word of mouth while 12 percent learned of the show through Sail magazine which is one of the media sources. In addition, 92 percent of those who visited the NISS shows were in Newport solely because of the show; other related figures for WBS and PBS were 85 percent and 88 percent, respectively.

The PBS was first held in 1982 and because of bad weather in late September, attendance was only 2,200. Forty exhibitors participated in this show. The average group size was 2.1 persons and the average stay was 1.0 day. The PBS visitors interviewed came from six states in the Northeast--Connecticut, Massachusetts, Maine, New Jersey, New York and Rhode Island. Rhode Island residents that visited the show accounted for about 50 percent of the entire visiting public. Eighty-eight percent of the visitors to this boat show (PBS) visited Newport solely to attend the PBS event.

The Rendezvous events refer to the seminars-clambakes-social events where boat owners and representatives of boat manufacturers meet. These manufacturers' Rendezvous events were also hosted by the NYC who provided

TABLE III.5 State of Residence of Boat Show Visitors

State	Wooden Boat Show		Newport Inter. Sailboat Show		N.E. Power Boat Show	
	FREQ	%	FREQ	%	FREQ	%
CA	7	1.8	-	-	-	-
CT	54	13.7	98	19.9	5	17.9
DC	6	1.5	1	0.2	-	-
DE	3	0.8	-	-	-	-
FL	6	1.5	6	1.2	-	-
FOREIGN*	13	3.3	14	2.8	-	-
GA	1	0.3	2	0.4	-	-
IL	2	0.5	6	1.2	-	-
MA	106	26.9	159	32.3	6	21.4
MD	9	2.3	1	0.2	-	-
ME	11	2.8	20	4.1	1	3.6
MI	7	1.8	3	0.6	-	-
MO	3	0.8	-	-	-	-
NC	1	0.3	3	0.6	-	-
NH	11	2.8	30	6.1	-	-
NJ	19	4.8	15	3.0	1	3.6
NY	52	13.2	38	7.7	1	3.6
OH	5	1.3	1	0.2	-	-
OTHER**	2	0.5	3	0.6	-	-
PA	16	4.1	10	2.0	-	-
RI	37	9.4	71	14.4	14	50.0~
SC	2	0.5	1	0.2	-	-
TX	3	0.8	2	0.4	-	-
VA	8	2.0	3	0.6	-	-
VT	5	1.3	5	1.0	-	-
WA	2	0.5	-	-	-	-
WI	3	0.8	-	-	-	-

*At the WBS - includes visitors from Australia, Canada, South Africa, England, and the Virgin Islands.

At the NISS - includes visitors from England, Switzerland, Canada, West Indies, Finland, and the Virgin Islands.

**At the WBS - includes one visitor each from Kentucky and Louisiana.

At the NISS - includes one visitor each from Colorado, Iowa, and Oklahoma.

Source: "The Economic Impact of the Major Boating Events at the Newport Yachting Center in 1982 on the City of Newport," By Tim Tyrrell, 1984.

TABLE III.6 "Where did You Hear About NISS?"

Information Source	Frequency	Percent
Came Before	188	38.52
Word of Mouth	105	21.52
<u>Sail</u>	58	11.89
<u>Soundings</u>	29	5.98
Newspaper	25	5.12
<u>Yachting</u>	15	3.07
<u>Cruising World</u>	15	3.07
<u>Sailing</u>	10	2.05
Radio	5	1.02
<u>Yacht Racing and Cruising</u>	2	0.41
<u>Motor Boating and Sailing</u>	2	0.41
Poster	1	0.20
Other	<u>33</u>	<u>6.76</u>
TOTAL	488	100.00

Source: "The Economic Impact of the Major Boating Events at the Newport Yachting Center in 1982 on the City of Newport," by Tim Tyrrell, 1984.

docking space, transportation, meeting facilities and other services for the participants and collected fees according to the number of persons per boat and the size of the boat. The six Rendezvous events studied were Motor Boating Sailing/Trawler Yachts, June 24-27; Sabre Yachts, July 2-5; Pearson Yachts, July 9-11; Swan yachts, July 28-August 1; Viking Yachts, August 6-8; and C & C Yachts, August 27-29.

Participants to the events came in groups with an average of 4.2 persons and stayed an average of 3.4 days. These participants came from more than six states--New York, Connecticut, Massachusetts, New Jersey, Florida, Rhode Island and others. Visitors from Florida out-

numbered all other states' visitors with 24.4 percent, Rhode Island and Connecticut with 23.2 percent each, New York with 19.2 percent, New Jersey with 5.6 percent, Massachusetts with 17.6 percent, and 8.8 percent for others.

III.5.2 The First Admiral's Cup Trials

The 1985 Brenton Reef Series was held May 10 through 19 in Newport to determine the selection of a United States contingent that challenged for the fifteenth Admiral's Cup sailed in England from July 29 through August 16 of 1985.

The first Admiral's Cup selection trials were sponsored by "SAIL Newport" and other local Newport individuals and organizations in 1983 and the local committee was organized in 1984. These trials were open to any yacht with an International Offshore Rule (IOR) rating from 30.0 to 40.0, but only those with ratings from 30.0 to 33.5 were eligible for selection for the U.S. Admiral's Cup Team. The latter rating band represents those that have performed best in previous Admiral's Cup races.

The United States Yacht Racing Union (USYRU) secured CIBA Pharmaceuticals as the promoter and Ida Lewis Yacht Club as the official host. Other sponsors included the State of Rhode Island, the City of Newport, "SAIL

Newport," Michelob, Pearson Yachts, Newport Onshore and other Newport businesses and individuals.

Of the thirty-eight boats which competed during these trials, thirty of them were considered eligible for the Admiral's Cup Team. Out of the thirty-eight racing teams, four were from Rhode Island (three from Newport and one from Pawtucket) and thirty-four from thirteen different states (8 from Connecticut; 6 from California; 4 from Massachusetts; 3 from New York; 2 each from Texas, Florida, Washington and New Jersey; and 1 each from Vermont, Delaware, Maine, Illinois, and Pennsylvania).

Research by Tyrrell and Klenk (1985) on this particular event indicated that average expenditures by the thirty-four out-of-state teams were less than \$12,000 per boat. These expenditures included entry fees of \$400 per boat, \$200 late entry fee after April 27, and \$100 late filing fee for an IOR. Research studies by Tyrrell and Klenk also showed that about half of the boats paid the late fees and these fees were paid to the Ida Lewis Yacht Club. Other forms of expenditure were meals, lodging, transportation in Rhode Island, boat repair and marina expenditures, etc. In addition, there were expenditures made by spectators. Even though the Admiral's Cup Trials is not a spectators' event, the studies showed that there were 100 out-of-state spectators

and about 20 Rhode Island spectator boats. Spectators' total expenditures were estimated to be \$3,000.00.

The number of crew in the competition for most of the boats was ten per boat. In addition, most participants were accompanied by an average of four friends, spouses, cooks and other support personnel. From these numbers, it was estimated that 532 ($38 * 14$) persons participated in the regatta as a member of a crew or associated with one of the teams, and about 100 other spectators attended the functions. Based on the time and date of arrivals, it was estimated that participants stayed an average of 2 weeks in Rhode Island.

The local organizing committee for the regatta and the USYRU received \$12,500 from CIBA and this amount was spent on the regatta. In addition, it was revealed that CIBA made an additional \$20,000 non-regatta expenditures.

III.5.3 The Tall Ships (1976) Event:

The Tall Ships Event is an event where large sailing vessels from around the world gather on an approximately biannual basis. In the summer of 1976, Newport, Rhode Island, served as host for this event.

The event was sponsored by the American Sail Training Association (ASTA) and involved an assembly of over one hundred ships from twenty countries. Approximately 6,000 crew members were aboard the 104 vessels visiting Newport to participate in the event. Among the ships were sixteen

Class A vessels which ranged to well over three hundred and fifty feet in length and were rigged with huge sail areas. In fact, this gathering of sailing ships was one of the largest in history. The ASTA incurred a variety of expenditures within the state in sponsoring the event. These included expenses for such items as promotion, hotel rooms, office space, and site operating and administrative expenses.

The primary event site comprised a substantial geographic area-significant portions of Jamestown Island and the town of Newport. Specific locations in this general area which attracted large concentrations of tourists varied through the seven-day event. Thus it was possible to consider the three related sub-events:

- 1) Arrival of the ships in Newport Harbour, June 24th-26th;
- 2) Activities held while ships were in port, June 27th-30th;
- 3) Parade of Sail or departure of the ships, July 1st.

Arrival of the ships attracted tourists to a variety of state designated coastal vantage points in Jamestown and Newport. Subevent 2) entailed concentrated tourist activity in the central business district of Newport adjoining the ships'docking sites and in surrounding areas. Departure of the ships again dispersed tourists to a variety of coastal areas in Jamestown and Newport. In addition to these patterns of tourist movement, a large

number of boating spectators observed the event from their vessels in Narragansett Bay. These shifting patterns of tourist concentrations had to be accounted for in the design of data collection methods by Della Bitta, Booth, Weeks, and Loudon in 1976. It was estimated that this event attracted 717,422 visitors.

III.5.4 The Swarovski Newport Maxi Boat Regatta

The 1985 Newport Maxi Boat Regatta was another in the biennial series. Swarovski America Ltd. (Cranston, R.I., producer of giftware, fashion jewelry, and outdoor optical products) was the sole sponsor of the 1985 Regatta. The event was held from July 7 through July 15, and "SAIL Newport" was in charge of the program and the Storm Trysail Club was in charge of the racing committee.

It was originally expected that as many as nine boats would participate in the Regatta. Research by Tyrrell and Klenk (1985) revealed that only four boats raced six days for the cup and one additional boat joined them on the last day of the event for match races. The Maxi boat races had been run competitively for the past four years, but not previously as a group. The event included five internationally known yachtsmen from Switzerland, New York, Boston and California. These yachts carried the highest allowable IOR rating of 70.0. The Swarovski Regatta was tailored for a media event. There were five day cup races, three of which could be followed from

various land sites in Newport and around Narragansett Bay and some of the boats were open to public inspection before and after the races. A handcrafted lead crystal trophy was awarded to the winner.

The boats arrived in Newport two weeks prior to the race. The average crew size was 26 but support personnel, families and friends probably made the persons per participating yacht double that number. Unlike events where there are small boats each contributing only a small amount to total economic impacts, the impacts of the Swarovski Cup competition were derived from a few large boats. There were five racing teams and each of these teams have been characterized by their respective dates of arrival and departure and expenditure estimates.

In general terms, total expenditure for all five teams was estimated at \$231,000. This included entry fees, pre- and post-repairs and maintenance, meals, lodging, entertainment, transportation, etc. Also, expenditures by the sponsors totaled about \$205,800.00; and these included administrative fees, press and local publicity, organizational and other promotional costs.

Because the Swarovski Cup Regatta is a media event, expenditures were also made by the spectator groups and the press. An expenditure estimate for the non-Rhode Island spectators was estimated to be \$140,558.00. Also,

non-local press expenditure was calculated to be in the neighborhood of \$14,000.00.

III.5.5 Block Island Race Week, 1986:

The Block Island Race Week is an annual yacht racing event comprised of two biennial series: A Storm Trysail Club regatta and a Yachting Magazine Performance Handicapped (PHRF) regatta. The Storm Trysail Club based at the Larchmont (New York) Yacht Club began their event in 1965 and it has continued to be one of the major events on the yachting calendar for odd-numbered years. This event was carefully planned for alternate years of the Newport-Bermuda race which is also in June.

Planning and organization of the event were done by International Yachting Events and Yachting Magazine and sanctioned by the USYRU. International Yachting Events managed all the "water activities" while Yachting managed sponsors, promotion and logistic support for the event. The 1986 race week was also sponsored by Trans World Airways and Volkswagen of America. Champlin's marina was headquarters for the race fleet.

Two hundred and twenty seven racing teams participated in the Race Week Events. These teams came from Connecticut, Massachusetts, New York, California, Florida, Maine, Illinois, New Jersey, Washington, Vermont, Delaware, Pennsylvania and Rhode Island. The boats began arriving at Block Island before the start of the event

activities. During Race Week three types of people inhabited Block Island. These were year-round and summer residents including the summer staff of the resort businesses; the people associated with the regatta; and the day trippers. These three groups were easy to indentify as each type exhibited different patterns of activity during the week.

A great deal of economic activity centered around the marina headquarters. Champlin's Marina has more than one hundred slips for boats, an olympic size swimming pool, a restaurant-bar, snack bar, and five thousand feet of water dockage and fishing piers with all modern conveniences. The owners of Champlin's Marina estimated that race week organizers would be spending \$10,000 and that participants would spend another \$15,000 at the Marina which would have received only about \$6000 if the event had not happened.

The entries in the 1986 competition were divided into nine divisions as shown in the table:

<u>Division</u>	<u>Class</u>	<u>Number of Entrants</u>
A	PHRF	12
B	PHRF	27
C	PHRF	29
D	PHRF	30
E	PHRF	28
F	PHRF	29
G	PHRF	31
H	J/24	18
I	Nonsuch	23

Like other racing events, most entries were accompanied by friends and spouses. The number of persons related to the participant was estimated by the number

wrist bands distributed during the event. These served as identification for purposes of admission to regatta social functions.

Based on arrival times, it was estimated that participants stayed an average of one week in Rhode Island. Many participants and their crews lived on their yachts. Also, many participants were lodged at different locations around the island. Accomodations included rental houses and cottages, hotels and motels. In addition to the 227 racing boats there were about ten additional support boats. Entry fees of \$135 per boat, and \$35 per persons for social functions (\$10 for juniors) were collected from the participants.

III.5.6 Description of Spending Groups

At least six major spending groups could be identified from the various short-term events examined in this study:

- 1) The Sponsors or Promoters of such events;
- 2) The Boaters, i.e owners and competitors in race events
- 3) The exhibitors and dealers participating in show events
- 4) The Trade Patrons attending the event
- 5) The spectators or general patrons.
- 6) The Press.

These spending groups were major sources of expenditures made within Rhode Island. Since economic

impact can result from each of these major groupings of visitors at the events, it is necessary to design measuring instruments for each. For example, the approach used to estimate the economic impact attributable to patrons boat shows is expected to be different from the approach used to estimate the economic impact of boaters in race events. Differences between these groups are outlined below.

The Sponsor or Promoter:

The sponsor is the person, group of people and/or companies that incur(s) expenses associated with implementing the event. The sponsor(s) incur(s) a variety of expenses from promotion, rental of land and floating space, site operating expenses, and administrative expenses, as well as other items such as the cost of police and fire protection. Certain events involve the sponsorship of the State.

The promoter receives monies from boaters, exhibitors, dealers, and trade patrons participating in the event as well as revenue from the sale of admission tickets to visitors of the event. Admission revenues are not included directly in impact assessment but indirectly through expenditures by the sponsors. It is difficult to separate wages, advertising, and other expenditures from the total sponsors' expenditures. This would be a useful separation in future short-term event studies.

The Participant Boaters:

These are usually the professional or amateur yachts men who participate competitively during race events. Some of the boaters travel in the company of family members, friends, cooks and relatives. As a result of participation these boaters, friends and family members etc. incur expenditures during the events. Typical of the expenditures which boaters could incur include food, lodging, entertainment and miscellaneous expenses such as those made at repair shops, gasoline etc., and boat expenditures such as marina and docking fees, cleaning, patching and repairs, and equipment and supplies.

Exhibitors and Dealers:

Exhibitors and dealers participating in the show events were identified as additional sources of economic impact. Their participation usually requires expenditures in Rhode Island on rather diverse items.

This category of spending group belong to manufacturing industries of boating products and accessories. Boat shows, in particular, are designed to display the beauty, glamour, and technology of boats and thus attract large numbers of spectators. Boat or boat accessory sales made by exhibitors at boat show events would be considered to be an impact to the state if the exhibitor is a Rhode Island resident. The primary Rhode Island expenditure categories of the exhibitor are transportation, adver-

tising of merchandise, exhibit preparation and operation, food, lodging and entertainment.

Trade Patrons, the Press, and General Public:

Trade patrons attend boat shows and races to conduct or facilitate future business. They were identified separately from general patrons under the assumption that their length of stay and expenditures per day could be significantly different from those of the general public or spectators. Members of the press are similarly separated.

Data acquisition involves personal interviewing of the general public during the event to obtain their estimates of Rhode Island expenditures associated with attending the event. Often it is not possible to obtain a similar set of information from the trade patrons or the press because of the difficulty of distinguishing them from the general public. Hence, trade patrons, press corps and spectators are often regarded as components of the general public.

CHAPTER IV

ECONOMIC THEORY APPLIED TO SHORT-TERM TOURISM EVENTS

IV.1 Introduction

In terms of economic theory, Samuelson (1967) states that any social science is subject to emotional biases and semantic disagreements over issues depending upon the theoretical eyeglasses through which it looks at the world. Although economic laws of observable human behavior are not exact--like the swing of the pendulum--economics can find probability patterns around which observations cluster. Samuelson's thought was shared by Hiller and Liebermann (1967) and Fred Hanssmann (1968). According to Hanssmann, rational selection from the alternatives requires a prior knowledge about the consequences of each alternative since "the problem rests mainly in the fact that the outcome of a decision depends not only on the alternative selected but also on specific environmental conditions that are not subject to control by the decision maker. These conditions--for example, the general economic climate, the future development of markets, the performance of a new technology, or the reactions of a competitor--maybe a subject of considerable uncertainty."

This chapter develops the theoretical foundations for a predictive model of the economic impacts of a Rhode Island short-term tourism event. The key decision variables in this model are prices, income, weather, advertising and capacity planning. The roles of these variables are described in later sections.

IV.2 Conceptual Framework for the Consumers

In this section, the Rosen (1974) model is adopted, and is used to develop the structural model of demand function for event characteristics. Also, the sponsor's maximization problem is examined under a constant-profit framework.

Consistent with the economics tradition, the demand functions of event characteristics are derived from the utility maximization framework. Except that the arguments of the utility function are events characteristics rather than goods, the required methodology is similar to that used in economic demand analysis.

The Rosen (1974) model focuses on the market for a good that can be completely described as a bundle of n objectively-measured characteristics, assumed to be positively valued by consumers. An event is assumed to be indivisible (one cannot buy fractional amounts of a visitor-day particular type), and each consumer is assumed to pay only one entry fee. The major advantage of the Rosen model is that alternatives of an event are available

for a continuous range of characteristics. The consumer demands and producer supplies can therefore be framed directly in terms of characteristics of the event.

IV.2.1 Advertising and Promotion

Consider a representative consumer who allocates income (M) between two competing goods X (a short-term event in Rhode Island) and Y (all other good) with prices given as P_X and P_Y . Y will include necessities such as food and clothing and competing tourist events. Also, allow a quality variable, perception, equals α to be associated with the primary good, X , and to influence the utility of the consumer. The perception variable is assumed to be a function of advertising about the event (A)

$$\alpha_i = \alpha_i(A).$$

The consumer's utility function $U(X(\alpha_i(A)), Y)$, is assumed to be quasi-concave and twice differentiable. The possibility of "product improvement" and its effects on demand enter through the perception variable.

The consumer's problem can be stated as a constrained maximization problem and is expressed as

Maximize $U(X(\alpha_i(A)), Y)$ subject to $M - P_X X - P_Y Y - cA$

where c represents the personal cost of information to consumer. In this formulation, the information or advertising variable could be exogenous or endogenous

depending on whether participants actively seek information on the quality of the events.

Given the above maximization problem, and assuming information is exogenous (i.e., $C=0$), the optimal policy for consumers is determined by the first order conditions of the Lagrangian:

$$L = U(X(\alpha_1(A)), Y) + \lambda (M - P_X X - P_Y Y)$$

$$L_X = U_X \alpha_1(A) - \lambda P_X = 0$$

$$L_Y = U_Y - \lambda P_Y = 0$$

$$L_\lambda = M - P_X X - P_Y Y$$

where subscripts denote first partials.

The first order conditions suggest that the demand for the event is a function of prices of X and Y and A which is an exogenous variable. Implicitly the function

$X_1 = X_1(P_X, P_Y, A)$ represents the demand for X_1 for any combination of prices and advertising.

The effect of a possible "event improvement" can be seen as a upward shift in the demand curve of the primary good as advertising influences the consumer's perception of the event quality.

IV.2.2 Tourist Event Characteristics

A number of variations of this model reveal useful theoretical properties. First, suppose we assume that the consumer's utility function is $U(X, Y)$; implying that $\alpha_1(A)$ is a pre-determined constant. A total differentiation of the utility function $U = U(X, Y)$ is given by:

$$dU = U_X dX + U_Y dY \quad 4.3.1$$

Suppose further that the quantity of event visitor-days (X) can be replaced by the quantities of beneficial event characteristics Z, which might include reputation, location and duration, for example. Then $U_X dX$ could be rewritten as

$$U_{Z_i} dZ_i = U(Z_1, Z_2, \dots, Z_n) dZ_i; \text{ and}$$

$$dU = U(Z_1, Z_2, \dots, Z_n) dZ_i + U_Y dY = U_{Z_i} dZ_i + U_Y dY \quad 4.3.2$$

Solving for Y from the budget constraint, substituting that into the utility function, and assuming Y is prices as a numeraire good ($P_Y=1$):

$$\begin{aligned} Y &= \frac{M - P_X X}{P_Y} \\ &= M - P_X X. \end{aligned}$$

Now, the consumer's utility function will be

$$U = U(X, M - P_X X).$$

If $P_X X = N$, then the consumer's budget constraint becomes $Y = M - N$. Structurally, therefore, $Y = Y(M, N)$ and $dY = Y_M dM + Y_N dN$. So, 4.3.2 now becomes

$$dU = U_{Z_i} dZ_i + (Y_M dM + Y_N dN) U_Y = 0. \quad 4.3.3$$

Next, we define an individual's expenditure function $N(\cdot)$ as the amount of money he/she is willing to pay in terms of other goods (i.e. Y) for alternative values of $z_1, \dots, z_n$ (i.e. X) holding utility and income constant, and given consumers' perceptions and preferences for the event, α . Substituting N for $P_X X$ and inverting the

utility function:

$$N = N(X_i; U, M) = N(Z_1, Z_2, \dots, Z_n; U, M) \quad 4.3.4$$

$$\text{And } dN = N_U dU + N_{Z_i} dz_i + N_M dM. \quad 4.3.5$$

Substituting 4.3.5 into 4.3.3 will result in

$$dU = U_{Z_i} dz_i + (Y_M dM + Y_N (N_U dU + N_{Z_i} dz_i + N_M dM)) U_Y = 0 \quad 4.3.6$$

Setting $dU = dM = 0$ and $dz_j = 0$ for all $j \neq i$ and noting that $Y_M = 1$ and $Y_N = -1$, we get

$$N_{Z_i} dz_i U_Y = U_{Z_i} dz_i \quad 4.3.7$$

Because the restrictions for maximization of a utility function are assumed to hold (i.e. $U_X > 0$ and $U_{XX} < 0$), it follows that $N_X > 0$ and $N_{XX} < 0$. In other words, the expenditure of a visitor during an event increases at a decreasing rate as the number of visitor-days at the event increase or as event characteristics increase.

From 4.3.1, $dY/dX = U_X/U_Y$; therefore, equation 4.3.7 shows that N_{Z_i} is the marginal rate of substitution between z_i and other goods (i.e. Y) foregone. And since Y is priced at numeraire, N_{Z_i} is the implicit marginal willingness-to-pay for z_i given utility, income and perception. The amount the consumer is willing to pay for z_i is $N(Z; U, M, \alpha)$, while $P_X X$ is the price he must pay to obtain the collection of event services. Some characteristics, such as good weather, will be demanded, but over which suppliers have no control.

Similar to Edwards (1984) these properties are illustrated in Figure IV-1 in the $N - z_1$ plane for three

consumers N_1 , N_2 and N_3 with different perceptions of a particular short-term event. Expenditure curves for consumers 1 and 2 are tangent to the market supply curve for tourism services. As drawn consumer 1 has a higher perception and preference for z_1 relative to Y other goods than consumer 2, while consumer 3's expenditure curve is everywhere below the minimum amount he must pay for z_1 , he will not attend the event unless he values other characteristics enough to make up the difference.

Each of the expenditure functions, N , in the figure describes the expenditures a consumer is willing to make for different quantities of z_1 , when his utility and monetary income are fixed. These functions and their analogies in X space, are important in determining monetary values for satisfaction received from attending an event and separating the effects of income changes from price changes on the demand for tourism events. The derivative of the expenditure function with respect to the quantity of visitor-days traces out the so-called "compensated" demand curve.

IV.2.3 Congestion

Consider the situation when aggregate demand increases to the point where congestion sets in and potential visitors may opt for less congested tourist sites to visit. This situation is reminiscent of Newport in the summer months. It therefore makes sense to state

Figure IV.1 Visitor willingness to pay functions

that there is a negative shift in demand for an event as congestion ensues. Figure IV.2 shows how different levels of congestion relate to consumers' willingness-to-pay to visit an event.

As before, consider an individual who maximizes utility subject to a budget constraint but now includes congestion as a negative characteristic of a tourism event. If all individuals react the same way to congestion, the average consumer will reflect market behavior. Panel A in Figure IV.2 shows MM_0 as the average individual budget line and UU_0 is the utility curve which is tangent to MM_0 at the optimal choice of goods, A. The individual's number of visitor-days at the event will be X_0 while he consumes y_0 of all other goods. As the number of visitor-days for all visitors increase, congestion sets in. For a rational individual, the number of visitor-days spent at the event will decrease to X_1 and his consumption of other goods would increase to y_1 . This new level of consumption is tangent to a lower utility curve UU_1 at a new optimal choice of goods, B. Implicitly, there is a higher price for the tourism event as it originally existed. In panel b of Figure IV.2, equilibrium positions A and B are plotted in the price and visitor-days plane. These points are on the "ordinary" demand curve holding the price of other goods and M fixed, but allowing utility received to vary.

Due to congestion effects, the implicit price paid by participants to the short-term event will increase to P_1 , and fewer people would be willing to visit the event. For an individual participant to remain at his initial utility curve U_0 , some form of compensation in income has to be given to that individual which will make him indifferent between points A and C in panel A of Figure IV.2. The amount of compensation which would need to be given to this individual can be calculated from the expenditure function, the so-called "compensating variation" (CV) measure of the welfare change associated with increase in congestion. In terms of the expenditure function, CV is the difference between expenditures required to sustain the utility level U_0 at implicit prices associated with different levels of congestion. This area is represented as P_1BCP_0 in panel b of Figure IV.2. In this case, the partial derivative of the expenditure function, with respect to the implicit price, gives the congestion compensated demand curve.

IV.3 The Production Decision

This section examines the profitability of sponsors' expenditures (i.e. advertising and promotion) for short-term events under static conditions. Before showing how profitable advertising could be for a short-term event, it is important to identify and describe issues that affect the sponsor's decision-making process. Some of these

include the type, quality and location of the event, number of days, entry fees and the effectiveness of advertising and promotion of the event.

The type of an event that a sponsor chooses depends on what event the sponsor thinks would be most attractive to its potential visitors and his experience with that type of event. This is important if the sponsor wants to maximize profits from sponsoring such events. The response of interest is the individual's perception of the event. However, the type of event is only one aspect of the product stimulus confronting the visitor. In other words, potential visitors to an event respond to entry fees, location and quality of the event, as well as the type of the event. The organization of these event attributes as production decision inputs depends on the perceptual process that visitors would use to interpret the event provided by the sponsor.

Sponsors spend considerable sums to entice tourists to visit their events. Most of the advertising and promotion are of a generalized character. Some short-term tourism events are co-sponsored by the state government through the Tourist Promotion Division of the Department of Economic Development--for instance, the Tall Ships Event. The promotion of such events by government offices could be viewed as a "collective good" from the point of view of the "regional" tourist industry. Promotional

expenditures by government could generate a net benefit in the sense that the benefits to the tourist industry may outweigh its costs to the government.

It seems reasonable that a sponsor of an event will adopt policies to maximize profits. Given that entry fees (prices) are predetermined and known, a typical profit maximization problem for a sponsor of short-term tourism events could be expressed structurally as follows

$$\text{Maximize Profit } (\$) = pQ(A,R) - c(Q(A,R)) - dA;$$

where $Q(A,R)$ is a production function which relates advertising and promotion, A , and consumers perception of event attributes, R , to the number of participants; and p is the entry price; d refers to the amount of dollars spent per unit of advertising and promotion; and $c(Q(A,R))$ refers to all other expenses incurred by the sponsor in the organization of the event. The latter includes items such as site operating expenses, administrative costs as well as cost of police and fire protection. Even though some of these expenses are predetermined, a larger crowd than anticipated could result in increased costs to the sponsor. In fact, the larger the number of participants, the higher are the effects of congestion. Thus, it makes sense to assume that organizational cost is a monotone increasing function.

Often, the event sponsor is a private firm and the costs of congestion may be overlooked. The sponsor may generate higher revenues through entry fees as more persons attend his event while the costs due to congestion are borne by the public. Some of the negative externalities brought upon the society through the event will influence consumers' perception of the event. Consequently, the reputation of the event may depreciate with increased participation levels.

In a generalized form, a dynamic model of reputation could be expressed as

$$\dot{R} = f(A, E) - \delta Q(A, R);$$

where $\dot{R}$ refers to change in reputation of an event over time and is positively affected by initial levels of consumer's awareness (E) of the event and advertising (A), $f(A, E)$, and negatively by the number of visitors, $\delta Q(A, R)$, where the term δ represents the depreciating factor due to increased levels of participation.

Now, the sponsor's profit maximization problem can be stated as:

Maximize Profit() = $pQ(A, R) - c(Q(A, R)) - dA$; subject to

$$\dot{R} = f(A, E) - \delta Q(A, R).$$

Setting up the above profit maximization as a Lagrangian leads to

$$L = pQ(A, R) - c(Q(A, R)) - dA + \lambda (\dot{R} - f(A, E) - \delta Q(A, R)).$$

The first order conditions are: (Note: subscripts denote

partial derivatives.)

$$L_A = pQ_A - C_Q Q_A - d - \lambda f_A - \lambda \delta Q_A = 0 \quad 4.3.1$$

$$L_\lambda = \dot{R} - f(A, E) - \delta Q(A, R) \quad 4.3.2$$

Equation 4.3.1 shows that marginal profit due to advertising is equal to the marginal cost of advertising plus the shadow value of the event's reputation as a result of advertising. That is:

$$pQ_A = C_Q Q_A + d + \lambda(f_A + \delta Q_A) \quad 4.3.3$$

From equation 4.3.3, and based on the assumption that participation is a quadratic function of advertising, the demand equation for participation might be expressed as linear-in-parameters:

$$Q = \beta_0 + \beta_1 A + \beta_2 A^2 + \beta_3 AR + \beta_4 R$$

Therefore,

$$Q_A = \beta_1 + 2\beta_2 A + \beta_3 R. \quad 4.3.4$$

Now, equation 4.3.3 could be re-written as

$$p(\beta_1 + 2\beta_2 A + \beta_3 R) = C_Q(\beta_1 + 2\beta_2 A + \beta_3 R) + d + \lambda f_A + \lambda \delta(\beta_1 + 2\beta_2 A + \beta_3 R) \quad 4.3.5$$

Also, if we assume that all other costs are a monotone linear function of Q and R , increasing C_Q could be expressed as

$$C = \alpha_0 + \alpha_1 Q + \alpha_1 R; \text{ and}$$

$$C_Q = \alpha_1 > 0$$

Also, if reputation is assumed to be a linear function of initial levels of consumer's awareness of the event, E , and advertising, A , $f(A, E)$ can be written as

$$f = a_0 + a_1A + a_2E$$

$$f_A = a_1 > 0.$$

Substituting the estimated parameters of C_Q and f_A into 4.3.5 will yield

$$p(\beta_1 + 2\beta_2A + \beta_3R) = \alpha_1(\beta_1 + 2\beta_2A + \beta_3R) + \lambda a_1 \\ + \lambda \delta(\beta_1 + 2\beta_2A + \beta_3R) + d.$$

Solving for A:

$$A = \frac{(\alpha_1 + \lambda \delta - p)(\beta_1 + \beta_3R) + a_1 + d}{(p - \alpha_1 - \lambda \delta)2\beta_2}.$$

Therefore $A = f(p, d, R)$.

Thus, the sponsor's demand for advertising is a function of reputation and entry prices at the event. Evidence from past impact studies shows that the demand function for advertising is consistent with a priori theory.

The decision on whether to advertise or not depends on the configuration of the event. Some events like boat shows may require publicity. The desired quantity of advertising is influenced by the event's overall reputation and how consumers perceive such events. But in some boat races, e.g., the Block Island Race Week, where participation is a tradition and space is limited, advertising is not necessary. In some other events, like The Tall Ships and America's Cup, media coverage of such events is paid by the media firms themselves because of the expected newspaper sales from such coverage. Therefore, the applicability of the demand function for

advertising is expected to be different for different events.

Next, we define an offer function, $p(\cdot)$, which indicates the minimum average price that the sponsor of a short-term event is willing to accept as an entry fee, at constant profit. This is obtained by solving the profit function for p . Structurally, producer's offer function is:

$$P^* = p(A, d, \pi; R).$$

At equilibrium, the offer is expected to equal demand. These properties are illustrated in Figure IV.3 in the P - A plane for three event sponsors with different advertising and promotion expenditures. All other attributes of the event are assumed to be at their optimal levels given. Sponsor 1 has a comparative advantage for producing higher and effective levels of A than sponsors 2 or 3. The cost conditions characterizing sponsor 3 precludes it from providing any A in its events. On the constant-profit supply curves, single points are revealed only for sponsors 1 and 2.

IV.4 Market Equilibrium

We have shown that

$$N(z_1, \dots, z_n, U; M, \alpha) \text{ for } i = 1, \dots, n$$

is a system of inverse Hicksian compensated demand functions for attributes z_i . Similarly, $p(A, d, \pi; R)$ represents a system of profit-compensated supply functions

Figure IV.3 Event sponsor constant profit supply functions.

for advertising and promotion in particular (which might be considered one of the event attributes z_{is}). The market is therefore in equilibrium when the sponsor's profit functions and consumer's demand functions are matched, i.e., when

$$N(z_1^* \dots z_n^*, U^*; M, \alpha) = p(A^*, d, \pi^*; R) \quad 4.4.1$$

where z^* , U^* , A^* and π^* are at their optimal levels. Graphically, optimal expenditure and offer functions lie tangent to each other. This is illustrated in Figure IV.4 for the two sponsors and two consumers whose activities are revealed in market for z_1 and A .

IV.5 Consumer Benefits from Short-Term Tourism Events

The subject of estimating consumer benefits has been discussed by Burt and Brewer (1971), McConnell (1977), Freeman (1979), Cesario and Knetsch (1976) and many others, both at the most rigorous levels of abstraction and in pragmatic and practical terms of application. The purpose of this section is to provide a systematic framework for the development of a measurement technique which could be used to evaluate consumer welfare gains from short-term events.

Before developing a framework for estimating benefits, it is important to explain the terms "demand" and "participation." Demand refers to the schedule of quantities that the community will desire at all possible prices; and participation or use is the

Figure IV.4 Envelope of visitor expenditure and sponsor supply functions.

realization of both demand and supply considerations. Since economic decision making involves the individual and the sponsor or producer, economic models tend to represent their behaviors. Accordingly, a priori information, in addition to the data needed for estimation, must be supplied before the estimation of economic models of the tourism and recreation market.

Ideally, one would like economic models to remain perfectly general. However, this is not usually practicable. Cicchetti, Smith, Knetsh and Patton in 1972 stated that one of the problems of outdoor recreation economics is the absence of competitive prices for the recreation services and secondly the fact that a single investment often changes the quantity of recreation services consumed substantially from the original level. Both of these complexities have been said to arise from high transportation costs associated with outdoor recreation and in particular the necessity of having consumers travel to the recreation or event site.

In spite of these problems, a set of individual ordinary demand functions for a potential event site can be specified as

$$Q_{ij} = f(\text{Socio-economic characteristics of } i^{\text{th}} \text{ individual, and supply characteristics of site } j \text{ and its relevant substitutes}).$$

where Q_{ij} is participation of i^{th} individual at j^{th} site.

Formally, the above demand function might be structured as

$$Q_{ij} = f(I_i, S_i, G_i, A_i, P_i, C, \alpha, D_i, \text{Type \& location of event}) \quad 4.5.1$$

where I_i = the income of the i^{th} individual;

S_i = the education of the i^{th} individual;

G_i = the age of the i^{th} individual;

A_i = vector of measures of the sponsor's advertising for i^{th} event;

P_i = vector of prices paid in order to participate;

C = weather index;

α = index of perception;

D_i = the distances travelled to get to event site.

Equation 4.5.1 assumes that the individual's decisions are the result of both his own demand characteristics and the characteristics of the supply available to him. However, the extent to which we must depart from this fairly general framework is determined by the availability of data.

With the estimation of equation 4.5.1, a demand curve could be traced out. The type of demand curve for short-term events might commonly be like that indicated in Figure V.5. Here, curve DD_1 represents the individualistic or estimated demand curve given low tourist use. It is possible that the actual demand curve resembles curve DCEF once social influences are taken into account. A typical tourist demand may be positively influenced by increased visitation levels at low levels of tourism and

Figure IV.5 A backward bending tourist demand curve.

negatively influenced at higher levels of tourist activity, and increased tourism may have a negative impact on tourist demand through congestion. Therefore, when tourist demand in a region is being planned, account should be taken of any social influences on the demand curve.

To avoid any complications that may arise from the demand curve DCEF, the demand curve DD_1 remains to be the estimated curve. A horizontal summation of equation 4.5.1 across individuals will result in an aggregate demand curve. A graphical analysis of typical demand for participation at events is presented in Figure IV.6. The demand curves are drawn holding all socioeconomic variables, prices, advertising, weather and perception variables constant.

Figure IV.6 depicts the demand and supply schedules for the community. At any point in time, the facilities available to the community are given, hence supply is perfectly inelastic. If we assume that the quality of the event does not vary with the quantity supplied, the static supply is q_1S_0 . The individual perceives this constraint only through the attributes of his experience at any given site. When the entry price, P , is known, actual quantity demanded can be predicted. Of course, price could be zero. When an event is poorly perceived, the demand curve is DD_1 and the number of visitor-days is Oq_1 . As

Figure IV.6 The demand for participation and the benefit as consumers perception of the event improve: supply is inelastic.

perception of the event increases, the new demand curve reflecting the improved perception becomes DD_2 . Even though the benefit attributable to improved perception is $DAGBD_2$, only $DABD_2$ is realized because of the constrained supply. Therefore, the area $DABD_2$ represents the increase in willingness to pay to maintain present use rates at the site rather than do without. This type of analysis is peculiar for boating events in which the sponsor and organizers are only able to accommodate a specified number of boats for that particular event. Thus supply is constrained and it is not uncommon that some boaters are turned down from participating.

On the other hand, an individual faces a series of perfectly elastic supply schedules, especially for media events such as the Tall Ships event. Figure IV.7 illustrates this.

In Figure IV.7, P_1 , indicates entry price. The welfare analyses are similar given an increase in perception. For instance, if entry prices were P_1 , initial demand will be at Oq_1 . But as perception increases, the new level of demand will be Oq_2 . The area $DACBD_2$ represents the additional benefit attributable to the improvement in perception.

This area could be divided into two categories. The first is the increase in consumer surplus or utility

Figure IV.7 The demand for participation and the benefit as consumers perception of the event improve: supply is perfectly elastic.

associated with Oq_1 level of use. This area is $DABD_2$ which represents the increase in willingness to pay to maintain present use rates rather than do without. The second is the greater attractiveness of the event due to improved perception which results in an increase in visitor days at the site $q_1 - q_2$; and the benefit associated with this increase in use is the area ABC.

CHAPTER V
TOURISM EVENT
ECONOMIC IMPACT ASSESSMENT

V.1 Direct Impacts

This chapter describes the approaches, methods and data used by Tyrrell, among others, to assess the economic impacts of short-term tourism events. These studies provided both an overview of the structure of the economic impact model, and some documentation of specific elements and data used in this study.

The focus in these studies has been on the expenditure made by the general public, organizers and sponsors of such events, competitive participants for boat races and boat exhibitors and trade patrons. The framework for event impact assessment segmented the spending groups into four major categories. Consequently, four categories of expenditures and "in kind" donations were used by Tyrrell (1985) to describe the economic impact of events on the state.

- 1) Expenditures made on Rhode Island goods and services (or "in kind" donations made in the state) by non-resident businesses or individuals because of the event. These expenditures and donations may have been made directly through participation or indirectly through event registration fees, event sponsorship, and other event finances. These expenditures directly benefit the State economy.

- 2) Expenditures made on non-Rhode Island goods and services (or "in kind" donations made outside the state) by non-resident businesses or individuals because of the event. These expenditures may have been made directly or indirectly through the organizing committee as in 1).
- 3) Expenditures made on Rhode Island goods and services (or "in kind" donations made in the state) by Rhode Island businesses and individuals because of the event. These may have been made directly or indirectly through the organizing committee.
- 4) Expenditures made on non-Rhode Island goods and services (or "in kind" donations made outside the state) by Rhode Island businesses or individuals because of the event. These may have been made directly or indirectly through the organizing committee.

Only the first and third of these categories were included in measuring the positive direct economic impact of an event on the state. Tyrrell claims that category 2) indicates expenditures which could potentially impact on the state if the same goods and services could be obtained locally. Items such as out-of-state promotion and advertising obviously could not be obtained locally but printing services could be. Category 3) indicates the local support for the event. Category 4), which would include out-of-state promotion and advertising from State funds, is a negative direct impact on the State economy associated with the event. These expenditures, which will hopefully result in greater expenditures in category 1), should be subtracted from those in 1) to obtain net direct economic impacts (Tyrrell, 1985).

Refinements of the four major categories suggested by Tyrrell (1987) involve the use of two sub-categories in (3) and (4). They are:

- 3a) Expenditures and donations by Rhode Island sponsors, promoters, spectators and participants in the event who would not participate if the event were held out of the state. These expenditures depend on the site, not the event. the state does not benefit from these expenditures since they are simply transfers between Rhode Islanders. However, these expenditures and contributions directly support Rhode Island as the site for the event.
- 3b) Expenditures by Rhode Island sponsors, promoters, spectators and participants in the event who would participate if the event were held out of the state. These expenditures depend on the event, not the site, but the state avoids losing these dollars by hosting the event. These are benefits (actually reduced losses) from holding the event in Rhode Island.
- 4a) Expenditures and donations by Rhode Island sponsors, promoters, spectators and participants in the event who would not participate if the event were held out of the state. These expenditures depend on the site, not the event. These are costs to the state since they are made out of the state because of the event, however, these expenditures and contributions directly support Rhode Island as the site for the event.
- 4b) Expenditures and donations by Rhode Island sponsors, promoters, spectators and participants in the event who would participate if the event were held out of the state. These expenditures depend on the event, not the site, but the state will lose these dollars regardless of where the event is held. These are investments in the event but cannot be counted as costs to the state because the event is being held in Rhode Island.

These sub-categories effectively separate support for the event from support for the site of the event. The details of these sub-categories in impact assessment is contained

in Tyrrell's 1987 study of the economic impact of Block Island Race Week.

A general economic impact model might be described in four parts: direct, indirect and induced impacts, and a feedback mechanism. The direct mechanism flows from exogenous expenditures by residents and tourists to industry sales, the secondary or indirect mechanism runs from industry sales to purchases, employee wages, government receipts and expenditures, and induced effects run from wages paid by the tourism industry to local residential expenditures. In addition, a feedback mechanism includes promotional campaigns by both the private and public sectors, however this has never been effectively modeled for tourism events.

Generally speaking, average expenditure profiles of short-term tourism event visitors were estimated from surveys conducted in Rhode Island by Tyrrell during and after the event. These expenditures were divided into specific categories of goods and services such as food, lodging, entertainment, recreation, gasoline and auto services. Participation-day estimates were then multiplied by expenditures per day to obtain total direct economic impacts.

Details of these studies involved identifying distinct spending groups of the participating population which accounted for major sources of expenditures induced

by the event. The methodology employed also attempted to isolate those expenditures made within Rhode Island. Expenditures made by the visiting public and trade patrons were estimated from the results of specific interview surveys conducted during the events. Furthermore, average expenditures per visitor per day were calculated and total direct expenditures estimated by summing the products of the numbers of visitors and average expenditures over the different groups of spenders.

V.2 Indirect and Induced Impacts

To determine the indirect and induced impacts, input-output (I-O) multipliers have been generally used. A multiplier is the ratio of total impacts to the direct impacts. Some include indirect and induced impacts; others include only indirect impacts. Multipliers are usually based on various economic measurement scales (e.g., output, sales, income, and employment) or even some physical measurement scales (e.g., residuals output per dollar value output). Multipliers are often used to evaluate the economic viability of development projects. Four different strategies in developing I-O multipliers have been enumerated by Chappelle (1985). They are:

- 1) Develop a regional input-output table from primary data developed in a sample survey for all sectors.
- 2) Develop a regional input-output table from a mix of primary and secondary data. Generally, the

primary data will be collected for sectors which analysts are interested in explaining in terms of the identified research problem.

- 3) Develop a regional input-output table from completely secondary data.
- 4) Develop multipliers by using a method other than input-output analysis.

The first alternative provides the most appropriate strategy needed in the development of multipliers for short-term tourism events such as those being studied in Rhode Island because it is particularly well suited where a small area, such as a county, represents the region of study.

The suitability of I-O methods to tourism-impact analysis as well as some of the short-comings have been discussed by Stevens and Rose (1985). Of particular interest to the authors was the advantage of detailed non-survey I-O models.

It has been claimed that non-survey models help to avoid the type of aggregation error that occurs when individual economic sectors are combined. The more highly aggregated the I-O table, the greater the variation among the production functions of the individual sectors that are combined into each aggregation sector. Also, there are greater variations among goods and services in an aggregated sector on the demand side within the region than there is in the production functions themselves. Thus, for regional impact analysis, the most highly disaggregated model is preferable. However, when regional

I-O models depend upon survey data, the tendency is to construct highly aggregated models in order to reduce the cost of data collection and analysis. Even when the available information is obtained from local surveys, expenditures still need to be further disaggregated for use in I-O analysis.

Ideally, it is important to have the most disaggregated model possible in order to minimize any errors due to aggregation problems. For this present study, the model that has input-output relationships for the State of Rhode Island should give the most reliable measurement of the economic impact.

In addition to the traditional economic impact studies, Bushnell and Hyle (1985) assessed economic impacts of recreation and tourism using commercially available input-output models. Three major alternative models which can be used in assessing indirect and induced economic impacts are discussed below.

V.2.1 RIMS II Modeling System:

RIMS II--Regional Input-Output Modeling System, version II--uses the 1972 Bureau of Economic Analysis (BEA) 496 input-output national model as the basis for the regional coefficients. These coefficients are further modified by the use of the Regional Location Quotient (LQ) technique. Simple location quotients have been defined as

$$LQ_{(i)} = \frac{E(i,r)/E(*,r)}{E(i,n)/E(*,n)}$$

where: $E(i,r)$ = Earnings in the i^{th} industry in the r^{th} region

* = the sum over all industries, and

n = the sum over all regions.

The $LQ_{(i)}$ refers to the ratio of the proportion of an industry's earnings to all earnings in r^{th} region and the proportion of that industry's, earnings in the nation as a whole. Thus it has been reported that an industry in which the region specializes will have an LQ greater than one while an industry in which the region does not specialize will have an LQ less than one.

To determine the proportion of the total sales of the regional industry that is accounted for, the sum of the national direct-requirements coefficient is multiplied by the regional location quotient if $LQ(i)$ is less than one or one if $LQ(i)$ is greater than one. The implication, therefore, is that the supplying industry will certainly not supply more than the demanding industry requires, even if the supplying industry is substantial. A regional matrix for all the industries within the region could thus be developed while omitting the household sector.

V.2.2 The REMI Models:

The Regional Economic Models Incorporated (REMI), Peacedale, RI, is also based on the latest available national input-output model furnished by BEA as is the

RIMS II modeling system. It, too, relies on multiplying each of the national coefficients by a factor in order to downscale the multiplier from national impacts to figures appropriate for the smaller region. But, the REMI model is different because it uses a concept termed "Regional Purchase Coefficients" (RPCs).

The RPC refers to the proportion of commodity or goods and services purchased by an industry within its own region. These RPCs are estimated by REMI from regression equations and this is made possible because regional purchases are considered a function of "relative delivered costs," where "relative delivered costs" are the sum of production and transportation costs. Relative production costs have been referred to (Bushnell and Hyle) as a "function of relative wages, relative other costs, and a relative scale of production and transportation costs, which is a function of relative average shipment distances for local versus nonlocal purchases. Average shipment distance is posited as being a function of the proportion of shippers-to-users in the region to shippers-to-users in the nation, and the proportion of land area in the region to land area in the nation.

With the above theoretical structure, the log of the RPC for each of nineteen industry groups was regressed as a linear function of "the ratio of industry per-worker wages in the region to the nation, the ratio of industry

employment in the region to the nation, the ratio of industry national output tonnage to industry total wages, the location coefficient LQ (as defined for the RIMS II model), and the ratio of the land area of the local area to the land area of the nation.

These independent variables as well as the RPCs could not be measured directly. It was therefore necessary to infer values for some of these variables. Inference on some of these values was accomplished by REMI through knowledge of the output of each commodity in the local region. Subsequently, coefficients of the model were estimated.

V.2.3 The IMPLAN Models:

The IMPLAN models were directed and funded by the United States Department of Agriculture Forest Service but implemented by Engineering Economics Associates, Inc. This system produces a transaction table for each county which would aggregate into state models and later national models. The transaction tables produced are then converted into a transaction matrix and then inverted to form the multipliers. The main objective of this model required that the Engineering Economic Associates, Inc. determine plausible proxies by which to break down the components of demand to estimate final demand sectors for the following: a) personal consumption expenditures; b) gross private domestic investment; c) foreign exports; d)

inventory change; and, e) federal, state and local government expenditures. Also, at the county level the following elements must be estimated for each sector. The elements are gross domestic output (GDP), employment and value added on employee compensation, property type, and indirect business taxes.

The advantage of the IMPLAN models is that the flow table generated for the local area could be inspected and altered before processing into technical and inverse form. A model for any standard metropolitan statistical area--SMSA, BEA region--and any other aggregation could be constructed simply by aggregating county data before applying it to the national coefficient matrix.

Even though these models--RIMS II, REMI, and IMPLAN--are designed with different goals in mind, they are equipped to assess the indirect and induced economic impacts of tourism and recreation.

CHAPTER VI

TOURISM ACTIVITY FORECASTING

The first significant outdoor recreation and entertainment survey was conducted during the period 1959-1961 by the Outdoor Recreation Resources Review Commission (ORRRC) with the intention of assessing the supply of outdoor facilities (Cichetti et al., 1973). In recent years there has been a phenomenal increase in research related to outdoor recreation and tourism (Chichetti, 1973). However, no previous studies have been done on forecasting economic impacts of short-term tourism events.

Recent studies in travel and tourism include those of Tyrrell (1982, 1985), Della Bitta et al. (1976, 1977), Smith (1981), Wolfe (1972), Holecek (1981), Guerts and Ibrahim (1975) etc. Those by Tyrrell and Della Bitta have evaluated the economic impacts that have been generated from short-term tourism events in Rhode Island, as described in the last chapter. Others have developed forecasting models. These are reviewed in this chapter.

Two basic approaches might be used to forecast tourism activities: objective and subjective. In addition, a combined approach based on Bayesian principles is also possible. The objective approach employs a model

estimated using historical industry data; the second involves judgmental predictions by tourism experts. A wide variety of objective models have been suggested. For reviewing these as models for short-term tourism events we have grouped them into three categories: time series models, single equation behavioral models, and market models. Within single equations, ad hoc behavioral models and empirical economic demand analysis are reviewed separately and the effect of advertising and promotion receives special attention.

The subjective approach includes regression and discrete choice modeling methods. A final section considers combining objective and subjective approaches using Bayesian principles.

VI.1 Review of Time Series Models

Most of the prevailing tourism forecasting methods make use of static techniques like regression and correlation analysis. These techniques ignore the dynamics or memory of the process involved and treat the data, which are mostly in the form of time series, as being independent. A popular technique which does not require the assumptions of independent data is exponential smoothing (Brown, 1962). However, it is an ad hoc technique and involves the problem of selecting, often arbitrarily, an appropriate weight factor. If serially correlated data are available, time series analysis

provides an ideal solution to the problem of impact prediction.

Most often, univariate time series analysis has been the usual approach used in forecasting tourist demand (Guerts and Ibrahim, 1975; Tyrrell, 1986). Most recent work in time series modeling has followed the Box-Jenkins (1970) method whereby seasonality in the data is accounted for by using a stochastic difference operator. Wu (1977) reported that the use of this operator may be ineffective or even inappropriate in certain situations, especially those cases in which the seasonality in the data is not homogenous. Tyrrell (1986) has used a seasonal difference operator and seasonal auto regressive terms to overcome this problem.

An alternative modeling approach to time series analysis in an actual business setting was suggested by Kapoor, Madhok and Wu (1981). The method uses deterministic functions to capture the nonstochastic structure in the data. These deterministic functions are obtained by the ordinary least squares method. Other methods include simulations and multiple-equation econometric models, but most often the I-O analysis is employed.

Because this study does not employ any time series data, none of the above regression approaches seem attractive.

VI.2 Single Equation Behavioral Models

VI.2.1 Ad Hoc Forecasting Models

DiMaggio, Useem and Brown (1978) have shown that attendance at a performing arts event is positively associated with income, educational and occupational attainment. A survey of the audiences for museums and performing arts found that heavy attenders at one live performing concert tended to be heavy attenders at other live performing arts events.

A study of predictors of participation in a performing arts by Andreasen and Belk in 1980, divided the population of four southern cities (Atlanta, Georgia; Baton Rouge, Louisiana; Columbia, South Carolina; and Memphis, Tennessee) into subsegments based on the resident's leisure-time use patterns, and then observed the likelihood of future participation in an event of performing arts. Thus, an array of data was developed on respondent's general life-style tendencies. Persons considered "hardcore non-attenders" of arts shows were eliminated from the survey because they were classified as having a zero probability of attending any of the performing arts.

In addition to the standard set of economic variables of income, educational and occupational attainment, Andreasen and Belk also included the following sets of questions: (a) "the extent to which respondents were

interested in a classical music or live theater when they were growing up; (b) the extent to which their parents were also interested in the same performing arts; and (c) whether receptivity to performing arts is higher or lower as one moves through the family cycle." Also included were questions about consumers expectations when attending a theater or symphony show and the importance of those expectations.

Using factor analysis and multiple regression, consumer life-style was measured at two different levels. The first level was the individual's use of leisure time, and the second level was the individual's more general activities, interests and opinions reflecting the general life-styles in which the leisure activities are imbedded.

The life-style approach examined how various arts behavior fit into more general life patterns. The measurement of attitude focused on predicting behavior by understanding the nature and value of the various outcomes that an individual expected from engaging in a behavior, e.g. attending the theater, symphony or any other event. Each participant was asked how likely it would be, on a 4-point scale, that they would obtain each of the stated outcomes (e.g., get exactly the seats you wanted, find friends at the event or understand what was going on), and also how important it was (also on a 4-point scale) to achieve these outcomes. In addition, respondents were

asked about their perceptions of what significant others expected of the respondent's arts going behavior. From the foregoing, the resulting model was of the following:

$$BI_{jk} = \sum_{i=1}^n I_{ik} B_{ijk} + NB_{jk}$$

where BI_{jk} = likelihood of respondent k attending the event j ,

I_{ik} = the importance weight given to consequence i by respondent k ,

B_{ijk} = the respondent k 's belief about the extent to which attending performing concert will result in consequence i and,

NB_{jk} = normative belief; the extent to which respondent k perceives that significant others believe he or she should attend performing art j .

Because a goal of the study was to predict future attendance, the dependent variable of the analysis was the individual's response to the question "How likely (on a 4-point scale) are you to attend theater/symphony in the next year or two?" The responses to this question were significantly related to prior attendance at such events but correlations were far from perfect. Several key variables, such as family life cycle and income were treated as a set of dummy variables to detect possible curvilinearities. For these variables, point biserial correlation coefficients were reported. Correlation coefficients greater than ± 0.045 were considered

statistically significant at the 95 percent probability level, given the sample size adopted.

The following variables were judged to be significant and positively related to likely attendance:

<u>Variable</u>	<u>Correlation with likelihood of attending</u>	
	<u>Symphony</u>	<u>Theater</u>
Education (on a 4-point scale)	.16	.19
Income over \$25,000	.05	.08
Interests in performing arts and similar events	.35	.23

And the following were significant but negatively related to likely attendance:

Age	-.07	-.12
Years in area	-.09	-.12

The variables judged not to be significantly related to likely attendance were:

Sex (female)	-.01	-.02
Race (white)	-.02	.01
Income under \$7,000	-.02	-.05

The family life cycle measure suggested that age may have been negatively related because of a) single adults, b) young adults with no children, and c) low attendance among older adults with no children. In addition to these variables, attendance was also found to be significantly related to years lived in the area, number of cars owned and negatively related to number of children over 14 years. The study confirmed that apart from the traditional predictor variables (education, income and occupational attainment) there are other unique variables with generally much higher correlation coefficients.

These included previous attendance and attitude towards the event.

As explained by the authors, "A problem with total prediction from these correlations is that many of the variables are related. For example, as income increases so does the number of cars in the family and the likelihood that the spouse is employed. The importance of several variables must then be assessed in explaining the likelihood of attendance while taking into account their interrelationships." To explain these interrelationships, Andreassen and Belk chose a "step-wise" regression procedure in which predictors are selected one at a time, starting with the single best predictor and adding that one variable at each "step" that increases the accuracy of the prediction. This continued until the best remaining predictor that could be added produced no significant improvement in the overall predictive accuracy. For instance, in the theater example, the best predictor of the likelihood of attendance was attitude toward going to the theater. Not surprisingly, the more one thinks the outcomes of event attendance will be favorable, the more these outcomes are important and the more significant other variables are seen as favoring attendance, the more likely one will be to plan future attendance.

VI.2.2 Empirical Economic Demand Analysis

A more formal description of the factors which influence behavior is given by empirical economic demand analysis. Based on the theoretical notions reviewed in Chapter III, it is possible to derive a model of demand for attendance at a tourist event which can be estimated using historical survey data and applied to future events. A key assumption behind such a model is that it reflects a consumer's economic values. The results can therefore be used to compute the value of the event above actual expenditures made.

The demand curve for a tourist event shows the number of people who would visit the event site for any given price. The area under the estimated demand curve and above entrance fee represents the monetary benefits to participants of being able to obtain all their desired recreation for that entrance fee. This willingness to pay more than the actual price of admission is known as consumer surplus.

The problem of demand estimation is easier when prices vary substantially. However, the typical practice for government sponsored tourism events is to charge a zero fee or a prespecified nominal entry price. Without any variations in these entry fees, it is not possible to estimate demand functions through direct procedures. However, it may be possible to infer how people would

respond to changes in the entry fee by examining data on how they respond to differences in travel costs. This is the hypothesis of the so-called Clawson-Knetsch (CK) travel cost method of demand estimation. The CK method is site specific. That is, it estimates the demand function for a specific site rather than for recreation activities in general.

The first step in the travel cost method is to estimate visitation rates as a function of travel costs (TC) from different geographic zones or areas such as counties, states, etc., and other explanatory variables. An important characteristic of zones is that travel costs from each zone to the site are assumed to be sufficiently close in magnitude across members of the zonal population to justify neglecting any differences in travel costs.

Suppose TC_{ij} equals the round trip travel cost from zone i to the event site j . Anderson and Bishop (1983) suggested that TC_i must be an "average marginal cost" in zone i . While TC_i is termed the travel cost, clearly it could include expenditures in items such as food, lodging, entertainment and access fees. If Q_{ijk} equals the total number of trips by residents of zone i to site j for activity k per unit time, and N_i is the population of the i^{th} zone, the general form of a "per capita trip demand function" can be stated as

$$Q_{ijk}/N_i = f(TC_{ij}). \quad 6.5.1a$$

The aggregate demand curve for n zones will therefore be a summation across all zones.

$$\sum_{i=1}^n (Q_{ijk}/N_i) = \sum_{i=1}^n f(TC_{ij}) \quad i = 1, \dots, n \quad 6.5.1b$$

For simplicity, we assume that the current admission fee to event site is zero. Since one point on the aggregate demand curve corresponds to the observed number of trips, additional points on the aggregate demand curve can be found by adding a hypothetical entry fee to TC_{ij} .

$$\sum_{i=1}^n (Q_{ijk}/N_i) = \sum_{i=1}^n f(TC_{ij}+P) \quad 5.5.1c$$

Thus, trips become a function of admission fees as well as travel costs. The estimated total visits at any admission fee P could be restated as

$$Q_{jk}^*(D) = \sum_{i=1}^n Q_{ijk} = \sum_{i=1}^n f(TC_{ij}+P) \cdot N_i \quad 5.5.1d$$

The Marshallian demand curve is then estimated by increasing P incrementally to obtain additional points until the fee P is found such that $Q_{jk}^*(P)$ is close to or equals zero. Further, an estimate of the Marshallian consumer surplus associated with participation in activity k at site j would be given by

$$\text{Value}_{jk} = \int_0^P Q_{jk}^*(P) dP.$$

The assumption that travel costs from each zone to the j^{th} site are sufficiently close in magnitude may be

violated for a number of reasons. Clearly, travel costs are a function of the travel time between the origin and destination. Also, there may be differences in tastes, preferences and perceptions or even incomes across zones. To incorporate travel time into the basic model, it has been suggested that the travel cost per visitor day could take into account the round-trip travel time as follows (Dornbusch, 1986):

$$TC_{ij} = \text{ROUND TRIP IN HOURS} * (\text{Transportation Cost per Visitor} + \text{Opportunity Cost of Travel Time}) \\ + \text{AVERAGE TOTAL OTHER EXPENDITURES}$$

where

Transportation Cost per visitor = Average operating and/or maintenance cost per vehicle (if visitors came by cars) or boat times average travel speed per hour divided by the size of group.

Opportunity Cost of Travel Time = one-third of average hourly wage rate.

TC_{ij} = travel costs from i^{th} origin to j^{th} site and

Average total other Expenditures includes expenditures on hotels, meals, entry fees, entertainment, etc.

It is expected that overnight trips would have lower travel costs per visitor as the round trip costs would be spread over many days.

The average operating cost per vehicle, for instance, could be determined from the United States Department of Transportation data. The data should represent a range of at least ten years so as to capture the average cost of

operating a range of cars based on their ages rather than just the expenses of operating a new car. The operating costs should include repairs and maintenance, gasoline, oil, and taxes on gas and tires. The fixed ownership costs of depreciation, accessories, insurance, garaging and titling may be excluded.

The travel costs are assumed to be shared by the number of passengers in the vehicle. The average group size can be obtained from a sample of completed surveys reported during an event.

The opportunity cost of travel time could be assumed to be one-third of the zonal average hourly wage rate. The choice of one-third of the average wage is in keeping with the previous estimates of one-fourth to one-half of the average wage rate as the opportunity cost of recreation travel-time (Cesario, 1976; Menz and Wilton, 1983; U.S. Water Resources Council, 1983).

With the specification of the travel cost model, the visitation demand equation can now be specified as

$$Q_{ijk}/N_i = B_{ojk} + B_{1jk}(TC*ij) + U_{ijk}$$

where

B_{ojk} and B_{1jk} are estimated coefficients

U_{ijk} = error term

N_i = population of a particular spending group in each zone.

One of the limitations of current efforts in empirical economic demand analysis is that the importance

of advertising and promotion is often ignored. That topic is treated separately below.

VI.2.3 The Effects of Advertising and Promotion

Tourism event "promotion" includes every activity that contributes in any way, directly or indirectly, to the promotion of profitable sales during an event. It is a more elusive term than "publicity" which embraces advertising and display. In business terms, promotion encompasses all selling activities and service features that in any way affect the selling of goods. Thus, sales promotion has been defined as the "coordination of publicity, personal salesmanship, and customer services in order to promote profitable sales" (Edwards and Brown, 1959).

Promotional activities for tourism events are being undertaken in Rhode Island by the State Department of Economic Development, local governments, and individual corporations and business concerns. Although emphasis and methods may differ among events, there is a fairly widespread agreement that successful event promotion comes as a result of thoughtful planning. In light of this, it can be concluded that the sponsors of short-term tourism events in Rhode Island have a fair knowledge of the expected influence of promotion on future participation levels.

Early studies by Schmalensee (1972), Borden (1942), and Wagner (1941) suggested that variations in sales of consumer goods are usually reflected in advertising. This implied a one-way causality from sales to advertising.

Other studies (Palda, 1964; and Melrose, 1969) on the mutual dependence of current sales and advertising in the long-term, advocated that simultaneous equation techniques must be employed in demand estimation. Consequently, they estimated the following.

$$\begin{aligned} \text{Sales} = & a_0 + a_1 * \text{Lag Advertising} + a_2 * \text{Dummy} \\ & + a_3 + \text{Time trend} + a_4 * \text{Income} \\ & + a_5 * \text{Lag Sales} + \text{Error term} \end{aligned}$$

$$\begin{aligned} \text{Advertising} = & b_0 + b_1 * \text{Sales} + b_2 * \text{Lag Advertising} \\ & + \text{Error term} \end{aligned}$$

The data for this study were obtained from the Pinkham Medicine Company from 1908 through 1936. The dummy variable represented the period between 1908 - 1925 in which it was given the value of one and zero thereafter. The system of equations was identified, but least squares estimates were biased and inconsistent.

However, the presumption, by Palda and Melrose above, that firms' current advertising budgets are influenced by their current sales is based on a market for goods which are produced and sold continually over time. Tourism event production and sales is highly discontinuous and, therefore, these traditional models are inappropriate.

Tourism event advertising is assumed to influence its future sales potential. It also seems certain that expected sales from short-term tourism events would influence advertising. A simplistic structural relationship is therefore represented as:

$$\text{Expected (sales)} = f(\text{advertising}).$$

$$\text{Advertising} = g(\text{expected (sales)}).$$

There are no studies on how expected sales from short-term tourism events influence advertising and vice versa. However, consistent estimation of firm or industry demand equations involving advertising must take into account the advertising decision rules of the firm concerned.

In the tourism industry, especially for short-term events, a priori theory places few restrictions on the form of the firm or industry demand functions. An attempt to measure the impact of advertising on short-term tourism events might therefore involve the examination of a large number of demand specifications, one of which is:

$$\begin{aligned} ES_t = & b_0 + b_1A_t + b_2S_{t-1} + b_3DI(t) + b_4Q(t) \\ & + \text{Error Term} \end{aligned}$$

$$\begin{aligned} \text{Advertising} = & a_0 + a_1ES_t + a_2R_{t-1} + a_3Q_t + a_4DI \\ & + \text{Error} \end{aligned}$$

where ES is expected sales; A = advertising; S_{t-1} = last sales from event; DI = disposable income; Q_t = level of participation; R_{t-1} = reputation for the last period and DTI represents change in disposable income, if any.

Theoretically, it is expected that an increase in disposable income would increase the level of participation. As such, it is expected that as DI increases, advertising should expand so as to capture new levels of participants.

Consistent estimates of these equations are desired. Therefore, the application of a two-stage least squares estimation technique would be required.

VI.3 The Market Share Models

Market share models account for substitution between goods. The most appealing is the linear learning model, based on work in psychology. Kuehn (1961) premiered the use of this approach. The hypothesis is that for the N^{th} household, the probability (P) of purchasing a particular good in the next period is given by:

$$P_i(t+1) = (a_i + bP_i(t)) \text{ if the household purchased good } i \text{ and}$$

$$1 - P_i(t+1) = 1 - (a_i + bP_i(t)) \text{ if the household did not purchase good } i.$$

To further simplify the equation of not purchasing, $1 - a_i$ is represented as c_i . Thus, $1 - a_i - bP_i(t) = c_i - bP_i(t)$. a_i , b and c_i are all positive constants. These two equations are referred to as gain and loss operators.

The above type of model, referred to as a linear learning model, is mainly used to fit individual family demand response. It is appealing as a description of

consumer interaction with their environment, however, the aggregate equations of consumers are very complex even if all consumers have the same gain and loss operators.

A modification of the above linear learning model for short-term tourism events involves rewriting the gain and loss operators, following Kuehn's (1961) example. Thus

$$P_i(t+1) = P_i(t) + [V_i - P_i(t)] \cdot G_i(P_i(t)) \text{ gain.}$$

$$1 - P_i(t+1) = 1 - [P_i(t) + (V_i - P_i(t))] \cdot L_i(P_i(t)) \text{ loss.}$$

The first of these equations represents the change in probability P_i when there is participation in the i^{th} event at time period t . The second is the case when alternative tourist events or no participation is sought in the same period. The parameter $\bar{A}$ is assumed to be a positive constant and V_i is the limit approached by probability P_i as participation in the i^{th} event continues without interruption for a large number of periods. If the number of alternatives in the market is constant, then

$$1 - V_i = \text{the sum of probabilities of participation in all alternatives sought.}$$

The above formulation assumes that do not vary across events. In other words, it assumes that learning processes are identical for all events. The reasoning behind this assumption is that the sum of the P_i 's is expected to be one and as such is identical in all events.

Rewriting the above operators and holding constant

in all cases and also identifying participation probabilities as market shares (MS) will yield

$$MS_i(t+1) = (1 - \beta \sum_i L_i) MS_i(t) + \beta L_i$$

where L_i = the lower limit of P_i when there is no participation. Thus, it is possible to write a fairly general first-order model for stationary conditions as

$$MS_i(t+1) = a_{0i}MS_i(t) + a_{1i}, \text{ where } \sum_i a_{1i} = 1 - a_{0i}.$$

Also, note that a_0 must be the same for all events. The notation $MS_i(t)$ represents the time spent at the i^{th} event divided by total time of all other alternatives.

The above models assume no changes in prices and advertising. The implication of this assumption is that equilibrium market shares are equal to shares of effective advertising. The simplest way to incorporate changing market conditions into the first-order model for stationary conditions is to make steady-state market share a function of price and advertising. Hence to determine the influence of price and advertising on the market shares of the tourism events being studied, the estimated model would be:

$$MS_i(t) = b_0 + b_1P_i(t) + b_2A_i(t) + b_3MS_i(t-1),$$

where P_i and A_i are measured entry prices and advertising in dollars. Obviously, the above model avoids the problem of simultaneity. Nonetheless, estimates from regression parameters are expected to be biased and inconsistent

because of the lagged right-hand side endogenous variable. For a consistent estimator to be obtained, an instrument for market shares has to be used.

The usefulness of market share models in advertising decision problems has been shown by Kuehn and Weiss (1965) in a model of grocery products. The following model illustrates Kuehn and Weiss specification.

$$MS_i(t) = \delta MS_i(t-1) + (1-\delta) \left[q \frac{r_i [P_i(t)]^{-e_p}}{\sum_j r_j [P_j(t)]^{-e_p}} + (1-q) \frac{r_i [P_i(t)]^{-e_p} [E_i(t)]^{-e_a}}{\sum_j r_j [P_j(t)]^{-e_p} [E_j(t)]^{-e_a}} \right]$$

where δ reflects the force of inertia or habit formation; q is the fraction of the market which is not influenced by advertising; e_p and e_a measure the sensitivity of demand to price and advertising, r (for i and j) allow the intrinsic attributes of the events to differ ($i \neq j$) and the variable $E_i(t)$ represents the i^{th} product advertising in period t which is estimated by depreciating past advertising outlays. Using the above model both Kuehn and Weiss concluded that the influence of advertising to grocery products were slight and negligible. Furthermore, it was even found that the estimate for q was quite large and significant. These results are counter-intuitive more so as both authors assumed zero habit formation. Their

findings could only be plausible in a world of zero learning and habit formation.

For first-time short-term tourism events, the importance of advertising cannot be overstated. Advertising plays a key role as to its success. For short-term tourist events that have been repeated annually or biennially, such as the Block Island Race Week, habit formation will dominate the effects of an advertising campaign which is not conducted by the sponsors.

Even though short-term tourism events, such as those being studied, could be considered as luxury commodities, many people's habits are expected to change as their disposable income, life style and perception of events change. It is therefore naive to assume $\delta = 0$ in any short-term tourism event.

VI.4 Review of Judgment Models

Applications of econometric or statistical methods based upon historical observation of actual consumer behavior, or applications of various multi attribute judgment methods such as conjoint or functional measurement, attitude theory, or the like have gained wide acceptability in the marketing literature.

Most researchers recognize the potential benefits of management judgment forecasts (Mabert, 1976; Staelin and Turner, 1973). For example, Staelin and Turner suggest that the wealth of market information managers collect

makes managers a desirable source of forecast data. Maber observes that there are motivational advantages to having the salesforce do forecasting, and sees benefits in having management judgment inputs about the reasons for sales pattern changes. Other authors, such as Dalrymple and Parson (1983), and Winkler and Makridakis (1983), suggest the possibility of forecasting with some combination of management judgment and systematic methods which capitalizes on desirable features and utilizes the information content of both approaches. In fact, a common problem in forecasting sales is the underutilization of available information pertinent to making accurate predictions.

The motivation for an integrated approach to this problem arises as a result of the following. First, the preliminary planning stages of an event often benefit from information relevant to configuring the event. Because there is uncertainty about which types of attractions to offer, information about the attractiveness of alternative configurations can be useful. Second, the capability of simulating choice behavior using judgmental methods gives valid insights into the likelihood of adopting a new event and how this likelihood of adoption varies as attributes of the event, sponsor, or decision environment are changed. These judgments may be quantitative, ordinal (i.e., rank orders), or discrete choices. The judgments

are analyzed quantitatively to estimate judgment functions.

Quantitative judgments can be in the form of market share estimates, rating scales or subjective probabilities. This form of judgment analysis has been used extensively by psychologists in studying judgment and decision. Because much of the early work concerned attempts to model the judgment process of clinical psychologists, research of this nature is frequently referred to as clinical judgment modeling (Green and Srinivasan, 1978). In addition to clinical psychology, the diversity of applications includes choosing stocks (Slovic, 1969), safety of highway design concepts (Adelman and Mumpower, 1979), intention to purchase residential solar systems (Scott, 1978), and the value of unit price information (Russo, 1977). Other related studies include work done by Louviere and Hensher (1983), Einhorn and Hogarth (1981), Slovic, Fischhoff and Lichtenstein (1977), and recently by Scott and Keiser (1984).

Much of the work has focussed on modeling quantitative judgment decisions as functions of certain predictor variables. A common model of judgment investigation is the linear compensatory evaluation strategy:

$$U_j = \sum_{i=1}^t b_i X_{ij}$$

where, X_{ij} specifies the degree to which the j^{th} concept possesses the i^{th} attribute, and the b_i is the weight placed on the i^{th} attribute by the decision maker in arriving at judgments on the concepts. Thus, for example, an event sponsor's overall judgment of the outcome of a specific event (U_j) would be a function of the attributes of the event and the degree of importance placed on each attribute. The b_i , therefore, is expected to reflect the compensatory balance among the attributes arrived at in evaluating the concepts. In light of this, the overall outcome of a multi-attribute event alternative is seen as the sum of the contributions of its attributes (Scott and Keiser, 1984). This model has been shown to achieve high levels of predictive validity across a wide range of applications (Dawes and Corrigan, 1974).

Modeling rank order judgments focuses on conjoint measurements (Green and Rao, 1971; Hensher and Louviere, 1983). Conjoint measurement is concerned with the joint effect of two or more independent variables on the ordering of potential choices. For example, one's preference for a particular event over alternative events may depend on the joint influence of such variables as projected expenditure during the event, location and number of days of event, type and reputation of event and so on. Conjoint measurement is particularly suited for estimating trade-off relations among decision criteria

because the ranking task requires a careful "trading-off" of each attribute against the others in arriving at rank order. A summary of important issues relating to the development and use of conjoint measurement in marketing research is presented by Green and Srinivasan (1978).

The discrete choice judgment models employ the use of probit and logit analysis to study discrete choice judgments. With this procedure, participants are asked to make such judgments as "will attend" or "will not attend" for each event.

Discrete choice models such as multinomial logit (McFadden, 1974), and multinomial probit (Daganzo, 1979) are now established techniques that are widely applied to the study of multiple-choice problems in marketing and other fields. Forecasting consumer demand for a unique cultural event in eastern Australia, Louviere and Hensher (1983) confined themselves to the multinomial logit model:

$$P_q(a/A) = \frac{\exp(U_a)}{\sum_{j \in A} \exp(U_j)}$$

where:

$P_q(a/A)$ = the probability that a randomly chosen individual, q , will select alternative a from a set of alternatives A ,

$\exp(U_a, U_j)$ = the exponentiated utility values for alternatives a and j , respectively,

$\sum_{j \in A}$ = a summation over all j alternatives contained in choice set A .

It is normally assumed that U_a can be expressed as a linear-in-the parameters and variables function of attributes of the competing alternatives and characteristics of the individuals. In Louviere's and Hensher's study, these attributes and their levels are varied experimentally and the personal characteristics of the respondents are treated as uncontrolled covariate terms. Their study focused upon the design and analysis of a discrete choice experiment to develop a model that forecasts choice type of exposition for the Australian Bicentennial at a particular cost, and upon incorporation of relevant segmentation measures into the forecasting models such as socioeconomic variables.

The results of the Louviere and Hensher study demonstrated that an integrated experimental design approach to choice analysis can yield sensible and useful choice forecasting results when compared to theoretical choice models such as the MNL model. Furthermore, when marketing data are lacking, suspect, or otherwise deficient, an experimentally designed choice or preference scenario approach represents an attractive alternative.

On the other hand, Scott and Keiser (1984) reported that results obtained from probit analysis show it appropriate for modeling choices made by industrial managers because it is a good representation of the "threshold" nature of industrial adoption decisions. In

the context of event participation, the decision to hold a new event, which involves a significant outlay of funds, depends on whether or not certain predetermined criteria such as minimum return on investment are met. Where the standards are met, the decision to adopt will be positive, otherwise funds would be funneled into other projects which do meet the specified criteria.

In addition to modelling causes of judgment decisions themselves, the decisions can be viewed as subjective predictions which can be used in conjunction with objective forecasts. This will provide a synthetic prediction which can take advantage of both formal analysis of historical data and the informal opinions of industry experts. Bayesian theory provides a framework for constructing this synthesis.

VI.5 Review of Bayesian Theory

The Bayesian approach is a statistical decision theory that generally emphasizes the accumulation of knowledge by a decision maker in the process of observing the statistical process he is studying. It relies heavily on the notion that some prior subjective knowledge is known. This makes it possible to continually up-date all knowledge as more information becomes available. An alternative use is to combine subjective and objective information in a formal framework. This is the use to be considered here.

It is known that Sir Harold Jeffreys made the major theoretical and applied contributions to Bayesian analysis. Most current research on Bayesian methodology and applications has been influenced directly or indirectly by Jeffrey's work. Some of the studies using Bayesian methodology include those of Zellner (1973, 1980), Turnovsky (1975), Kadane (1980), Winkler (1980), Judge et al. (1980), Bunn (1975, 1977 and 1979), and Blumenthal (1980), to mention a few.

The Bayesian methodology has been used extensively in statistical estimation. Studies using the Bayesian analysis range from estimation of Box-Jenkins transfer function-noise models (Newbold, 1980) to full information analysis of simultaneous equation (Dreze and Morales, 1980). In terms of forecasting, relatively little has been done with the Bayesian method. A greater use of the Bayesian theorem has been found in the synthesis of predictive models. One of more recent examples is Blumenthal's (1980) Bayesian updates in Turning Point forecasts. In this study, he combined subjective judgments with statistical facts to forecast the turning point and updated the existing degree of belief by multiplying by the likelihood functions of simple data.

Decision-makers are confronted with an increasing number of predictive models. In selecting the "best" model, the decision-maker or forecaster often discards

relevant independent evidence in those models rejected. Hence, the methodology of combining forecasts through the Bayesian methodology has been suggested by Bunn as a valid approach. With such procedures, it has become possible to assign subjective probabilities over a set of forecasting models and updating the processes, via Bayes' theorem, when the forecast realizations become known. Results obtained from such procedures have been certified as efficient and stable. Hence the Bayesian procedure of combining forecasts has been adopted in this present research.

CHAPTER VII

A PRELIMINARY ECONOMIC IMPACT FORECASTING MODEL

VII.1 Introduction

Tourism has increasingly become one of the leading industries in Rhode Island because of a number of on-going trends (Tyrrell and Tirpaek, 1982):

- 1) increases in available leisure time,
- 2) increases in the number of women entering the work force and earning income,
- 3) increases in the number of healthy retirees,
- 4) increases in the proportion of population in the 25-35 years age group, and
- 5) rising real incomes.

Although the major portion of the industry has remained fairly concentrated near a few major resorts such as Newport, Washington County and Block Island, tourism continues to receive an increasing amount of attention by many communities as a potential new source of economic growth. As a consequence, a strong need has been expressed by private and public groups for facts about the current status of the tourism industry and the potential for its continued growth. An important element of the industry is the contribution of specific short-term tourist events. To this end, this study has been designed

to develop an economic impact forecasting model for such events.

Economic impacts cannot be defined without specific reference to the county or local community in which the tourist event takes place. The issue is complicated conceptually by the existence of several possible regional demarcations. Usually, it is difficult to track commodity and factor flows across space. The local community hosting an event is most likely to receive a greater share of the impacts--either positive (employment, income, tax revenues, etc.) or negative (pollution, congestion of traffic which may lead to increases in infrastructural costs, disamenities, etc.). Also, the impact on adjacent communities would be of interest to decision makers at higher levels.

There are supply and demand-related impacts to consider. On the supply-side, impacts refer to changes in sales, work force, and earnings of the sponsors of short-term tourism events, equipment and facilities. Among these are the manufacturers of tourism/sporting/recreational equipment, vehicles, boats, etc. On the demand side, impacts pertain to changes in sales, employment and earnings made by service industries like hotels and lodging places, eating and drinking places, auto repair and service stations, local transportation firms, etc. The total direct impact of short-term tourism events can

be viewed in terms of supply or demand impacts. However, a selected combination is most practical from a research perspective and of most interest to policy makers. Thus, direct impacts can be computed as the sum of expenditures by tourists and other participants (excluding event entrance fees) and expenditures by sponsors and promoters of the event.

The magnitude and type of activities possible at the event are related to the availability of facilities. This availability is viewed as a necessary condition of a potential site because the scenic, cultural and environmental attractions are essential requirements for a viable event.

Direct event impacts are related to the construction and maintenance of facilities and advertising and promotion of events, and also to the participation of both residents and tourists (non-resident visitors) to events. Although a theoretically correct measurement of economic impacts might focus solely on supply-side effects as measured by changes in net value added, political decisions are importantly influenced by the distribution of gross changes in value added by all economic activity.

An event impact forecasting model has been designed to forecast direct sales impact caused by major Rhode Island short-term tourism events. It is driven by demand and supply variables such as prices (includes travel cost

plus other expenditures such as food and lodging, entertainment and recreation, marina and dock fees, etc.), consumer's perception of event, advertising and weather conditions. The predictions consist of estimates of the number of residents and tourists, where possible, that will be attracted to the event from the assumed market area of Northeastern U.S.A., as well as the direct sales by Rhode Island businesses which result from the event. A flow chart illustrating the linkages between components of the model is shown as Figure VII.1.

A preliminary version of the model which parallels the flow chart has been constructed and tested for two types of marine events: boat races and boat shows. Its construction is described in this chapter and its application and validation are described in the next chapter. There are three major components: a participation submodel, an expenditure submodel, and an impact assessment submodel.

VII.2 The Participation Forecast Sub Model

Ideally, a simple event participation model could be formulated as:

$$Q = f(\text{Consumers Perception, Prices, Weather})$$

where Q refers to participation level in a particular event in terms of visitor-days, and $f()$ is general functional notation.

Figure VII.1 Economic impact model for a tourism event

Figure VII.1 cont'd.

Data requirements for estimating this model by traditional methods are prohibitive since each observation requires the study of a separate event. As our only practical alternative we have estimated the influence of each of the variables separately using indexes for prices, weather, and consumers' perceptions. In addition, we have combined the empirical (objective) forecast with a judgment (subjective) forecast by experts using Bayesian techniques.

VII.2.1 The Empirical Participation Sub Model

The empirical participation sub model is expressed structurally as

$$F_1 = Q_0 * I_S^\alpha * I_W^\beta * I_P^\gamma; \quad 7.2.1$$

where F_1 = predicted visitor-days

Q_0 = constant term which refers to the average participation rate for an average event. This is obtainable as the simple average of participation at similar events

I_S = price index

I_W = weather index

I_P = perception index, and

α, β, γ = unknown coefficients.

The above model suggests that an "average" event would have the property of $I_S = I_P = I_W = 1.0$ and thus would predict the average event exactly. Accordingly, the estimated indexes for the different short-term events are likely to range from 0 to 2.0, with 1.0 as the average

index. These indexes are quantitative measures of separate influences on participation. The above function is transformable to

$$\ln F_1 = B_0 + \alpha \ln I_S + \beta \ln I_P + \ln I_W.$$

The estimation of the above will give the elasticities of the various indexes, which are the estimated coefficients. The constant term or intercept here is B_0 which is equivalent to $\ln(Q_0)$. Actual projections of participation-day are derived by multiplying projected values for the indexes, in terms of logarithms, by the relevant coefficients of the estimated functions, summing the results and taking the antilog.

Due to severe data limitations, it was not possible to empirically verify the importance of prices and weather as significant determinants of participation at a boat racing event. Thus, the participation forecast model for boat races was restricted to

$$F_1 = Q_0 * I_P^Y ; \quad 7.2.2$$

The definitions of the terms above remain as is. Future data collection would help in justifying the above models. It would also be possible then to reassess the importance and influence of price, weather and advertising variables on participant boaters' attitudes or behaviors to attend. How-be-it, equation 7.2.1 is the participation model used for boat shows.

VII.2.1.1 Estimation of IndexesPrice Index:

The results of the estimated demand functions,
 $\text{Log}(P_i/1-P_i) = B_0 + B_1\text{Travcost} + B_2\text{Income} + B_3\text{Education}$,
 in Appendix C, for the "representative" boat show and race
 are shown in Table VII.1 and were used in estimating price
 indexes not only for the NISS and BIRW but also for the
 Wooden Boat Show, New England Powerboat Show, both of
 1982, and Admiral's Cup Trials (Brenton) of 1985. We have
 assumed that the demand curves for the three latter events
 would resemble those estimated for the NISS of 1982 and
 BIRW 1986. The main focus here is to show how an increase
 or decrease in entry fee would affect the proportion of
 zonal population that would visit or participate in an
 event.

Table VII.1 Estimated Demand Functions for Representative
 Tourist Events

Dependent Variable: $\log(P_i/(1-P_i))$

Independent Variable	NISS 1982		BIRW 1986
	Tourists	Residents	Boaters
Intercept	-6.87	0.546	-2.4044
Travel cost	-0.042	-0.423	-0.0055
Income	-0.00004	0.0002	0.0002
Education	0.007	0.003	-0.015

The demand model can be expressed as

$$P_i = \frac{1}{1 + \exp^{-(a+b_1(X_1+M)+b_2X_2+b_3X_3)}} \quad 7.2.3$$

where X_1 = travel cost from visitors origin to event site.

X_2 = Household per capita income

X_3 = percentage of the zonal population completing a specific number of years of education.

and M = average expenditure per visitor-day plus entry fee.

To estimate a price index for individual short-term events, the predicted proportion for that event is divided by the proportion of visitors at an "average" event predicted by the model. P_j is similar to P_i and defined as

$$P_j = \frac{1}{1 + \exp^{-(a+b_1(X_1+M^*)+b_2X_2+b_3X_3)}} \quad 7.2.4$$

and M^* represents average visitor-day expenditure plus the average entry fee for the "average" event. X_1 remains to be the estimated travel cost which is assumed to be a constant for all similar events. Therefore:

$$I_\$ = \frac{P_i}{P_j} = \frac{\frac{1}{1 + \exp^{-(a+b_1(X_1+M)+b_2X_2+b_3X_3)}}}{\frac{1}{1 + \exp^{-(a+b_1(X_1+M^*)+b_2X_2+b_3X_3)}}} ,$$

$$I_\$ = \frac{1 + \exp^{-(a+b_1(X_1+M^*)+b_2X_2+b_3X_3)}}{1 + \exp^{-(a+b_1(X_1+M)+b_2X_2+b_3X_3)}} \quad 7.2.5$$

Table VII.2 Average Total Expenditures of Short-Term Events Studied

Type of Event	Average Entry Fee (\$)	Average Expenditure at Event (\$)	Estimated Average Travel Cost (\$)	Average Total Expenditure (\$)
Boat Shows (All Visitors) (per day)	Tourists Residents	Tourists Residents	Tourists Residents	Tourists Residents
NISS '82	6.00	42.50	12.11	60.61 23.4
WBS '82	5.00	68.54	12.11	85.65 25.78
PBS '82	4.00	5.05	12.11	21.16 6.43
Average Boat Show Event	5.00	---	12.11	(X+M*) in 6.3.6
All Participant Boaters				
Boat Race	Boaters			
BIRW '86	2.12	38.58	54.78	95.48
Brenton '85	2.35	67.68	54.78	125.26
Average Boat Race Event	2.23	'A'	54.78	(X+M*) in 6.3.6

'A' = Average Expenditure at specific event is assumed to be the same for the Average Boat (Show or Race) Event. Expenditures are on a visitor-day basis.

Brenton = Admiral's Cup Trials of 1985.

NOTE: Average entry fees for boat shows are daily fees charged at the gates to the show.

Fahrenheit) over a 20 hour period each day. Evaporation data were measured using a U.S. Weather Bureau class A evaporation pan in one hundredths of an inch. Rainfall was also recorded by a rain gauge in one hundredths of an inch.

However, a practical difficulty in identifying a rainy day was encountered. The climatological data records rainfall for a 24 hour period. It is not possible to differentiate whether the recorded rain amounted from rain at night or day. Taking a conservative approach "no rain" days were identified as those days where no measurable rain was recorded over a 24 hour period (less than one hundredth of an inch).

In spite of these difficulties, weather conditions continue to be a major influence on outdoor event participation. Participation is significantly diminished because of bad weather. Timothy estimated how weather variables affected participatory behavior of residents and tourists in the Washington County beaches. The impact of the weather variables in the participation model is assumed to affect participation in outdoor events in a similar manner. The following participation model was estimated by Timothy and the results of the estimated parameters are shown in Table VII.3.

$$L_n(\text{Participation}) = B_0 + B_1\text{Weekend} + B_2\text{Temperature} \\ + B_3\text{Evaporation} + B_4\text{Rain} + B_5\text{Quart} \\ + B_6\text{Trend}.$$

Table VII.3 Participation Models for Residents and Tourists Visiting Washington County

$$\ln (TOTR) = -1.3464 + 0.3148 \text{ Weekend} + 0.0872 \text{ Temp} + 0.06 \text{ Evap}$$

(-1.14) (1.61) (5.57) (4.19)

$$-1.3991 \text{ Rain} + 0.0806 \text{ Quart} + 0.02 \text{ Trend}$$

(-6.06) (.34) (3.10)

$R^2 = 0.536$ t statistics in parentheses

$$\ln (TOTT) = -0.2605 + .6036 \text{ Weekend} + .0699 \text{ Temp} + .031 \text{ Evap}$$

(.23) (3.23) (4.66) (2.26)

$$-1.305 \text{ Rain} + .6978 \text{ Quart} + .012 \text{ Trend}$$

(5.96) (3.10) (4.1)

$R^2 = 0.564$ t statistics in parentheses

TOTR = Number of Rhode Island resident participants per day

TOTT = Number of Tourist participants per day

Trend = A dummy for 1983 (=1)

Source: Washington County Beach Simulator by D. P. Timothy (1984).

The estimated coefficients of temperature, evaporation and rain have been utilized in estimating a weather index for both Rhode Island resident and tourist participants. Because many of the events run through weekends and are held in summer, the effect of "Weekend" and "Quart" variables are assumed to be constant. Trend was a dummy for 1983 in the model and is not expected to affect weather outcomes for the events studied.

The approach that has been used to estimate the weather indexes is similar to those of prices in format, and is presented below.

$$I_W = \frac{(B_0 + B_1 * T_e + B_2 * E_e + B_3 * R_e)}{(B_0 + B_1 * T_M + B_2 * E_M + B_3 * R_M)} \exp \{ B_1 (T_e - T_M) + B_2 (E_e - E_M) + B_3 (R_e - R_M) \} \quad 7.2.6$$

where I_W = weather index of participation
 T_e = average temperature during the event
 T_M = average monthly temperature
 R_e = proportion of rain days during the event
 R_M = proportion of rain days in month of the event

E_e = evaporation during the days of event
 E_M = monthly evaporation data.

If an event is an indoor event, then the impact of weather may be negligible because participation in an indoor event will not be affected by any bad weather. In fact, it is likely that people may opt to visit an indoor event on a rainy day so as to break the boredom of staying home because of the bad weather. Although a rainy day may prevent the start of a competitive boat race, it may not prevent competitive participant boaters from competing in the event. Thus, the influence of bad weather may not be very significant on a boat race unless it rained throughout the scheduled event period, which is not a likely occurrence. However, bad weather could affect

participation in a race event if the marine forecast for the period of the event is not favorable for any sailing event. The extent to which this is possible is not known at this stage.

Weather is something that is beyond the control of man. Therefore, it is difficult to arbitrarily project weather conditions. For forecasting purposes, projections of weather conditions would be made from historical weather data. In many instances, there may be a slight or no difference in the weather pattern during a specific event--more so when they are scheduled within summer months.

Perception Index:

Perception index is a relative measure of how much an event appeals to its potential clientele. In other words, it is an attractiveness index. This attractiveness index is related to information received through advertising of the event. Thus, the perceived quality of an event could be defined as a dependent variable.

$$R = f(A, E),$$

where R = Perception of Consumers

A = Advertising or Source of Information

E = Some event attributes with heaviest impacts on visitors, such as location. This includes existing reputation of event site before any advertising. Thus, $E > 0$.

It is expected that visitation rates may be higher in urban areas than in rural settings because of the business

potential of urban centers. Even though it may not be possible, in this study, to verify statistically the relationship between location and perception, it is obvious that consumers' perception of an event and its location influence their behavioral intentions.

In order to determine the effect of consumers' perceptions of an event and its location, an attractiveness index which measures the emotional evaluation and response of consumers has been constructed. A survey of experts was used in this aspect (see Appendix B).

Ideally, we would have been happier to know how individual participants sampled perceived different short-term events. However, Davis's (1971) study of water quality showed that water bodies which individuals perceived as polluted were also regarded as polluted by experts in the field. Also Binkley and Hanemann (1975) and Dornbusch (1975) argued that while there may be a significant connection between the "objectively" determined water quality of the experts and the "subjective" water ratings of the public, the degree of association between them does not appear to be very great.

Because of the difficulty in obtaining consumers' perceptions of events, we therefore proceed to show the experts' assessments of the consumers' perception. The goal here is to measure the experts' opinions on how consumers perceive short-term events. This is achieved by

measuring experts' beliefs about various location attributes in Appendix B and the attractiveness of the individual events. It is important to note that this formulation does not capture the relative importance of the events and location attributes to consumers. As is expected, consumers would react differently to particular features of the sites and events visited. Thus, consumers are bound to find different sources of satisfaction and would naturally assign different priorities to alternate attributes.

Experts' assessments of consumers' perception to different short-term events were used in deriving an attractiveness value under the assumption that all the location attributes are weighted equally. Thus,

$$A_{oi} = \sum_{l=1}^n B_l * E_{kj},$$

where B_l = numerical attractiveness rating for the type of event (good to bad); $l = 1, \dots, n$ events.

E_{kj} = consumers' evaluation or rating of specific attributes of event locations, $k = 1, \dots, n$ at j^{th} locations.

A_{oi} = consumers' attractiveness value from each expert (i) surveyed.

The above model does not relate to how people form their attitudes towards an event on the basis of their beliefs. A Fishbein model, on the other hand, would capture the importance of various event and location attributes to the consumer. A description of the Fishbein model is in

Appendix D. However, Cesario and Knetsch (1976) used an approach which is similar to the one adopted in this study for deriving an attractiveness index that measured the inherent appeal or quality of recreational facilities.

Following, therefore, is a demonstration of how the experts' opinions on consumers' perception of an event has been calculated in this study. The reliability between experts' ratings is close enough to justify the use of our model. The key words are index and weights. For expert called "T", A_{OT} for NISS 1982 at Newport for the general public is

$$A_{OT} = (B_1 * E_{11}) + (B_1 * E_{21}) + (B_1 * E_{31}) + (B_1 * E_{41}) + (B_1 * E_{51}).$$

The ratings of the attributes of location and for the event range from 1 to 10; and since the estimated weights of A_{Oi} are used in estimating perception indexes (with an "average" event having an average index of 1.0), individual A_{Oi} 's are divided by one hundred.

Subsequently, the weight for an "average" boat show or race will be the sum of all A_{Oi} divided by the number of individual boat shows or races.

$$A_M = \sum_{i=1}^n A_{Oi} / K, \text{ where } A_M = \text{weight of "average" event,} \\ \text{and } K \text{ is the number of similar events} \\ \text{across the experts.}$$

For example, the weight of an "average" boat show is 3.23 for participant and spectator boaters and 2.52 for the general public.

Similarly, the weight for any particular event is

$$A_o = \frac{\sum_{i=1}^n A_{oi}}{n}, \text{ where } n = \text{number of experts.}$$

Therefore, the perception or attractiveness index for a short-term event can be defined as the ratio A_o to A_M . That is

$$I_p = \frac{\frac{\sum_{i=1}^n A_{oi}}{n}}{\frac{\sum_{i=1}^K A_{oi}}{K}} = \frac{\text{Weight of a Specific Event}}{\text{Weight of an average event that is similar to the specific event}}$$

One of the short-comings of the perception model discussed is that it assumes that different location attributes have equal weights. One solution to this problem is the application of the Fishbein's behavioral intentions model. The present study, therefore, suggests that future short-term events study should adopt the Fishbein's model in assessing consumers' perception and attitude towards a short-term tourism event.

The values of the estimated participation indexes--price, weather and perception--are presented in Table VII.4. These indexes would be used in regressing the suggested empirical participation model. Thereafter, the estimated coefficients would be used in generating empirical forecasts for short-term events.

Table VII.4 Table of Indexes of Price, Weather and Perception

Event	Price Index ($I_{\$}$)		Weather Index (I_w)		Perception Index (I_p)	
	<u>Tourists</u>	<u>Residents</u>	<u>Tourists</u>	<u>Residents</u>	<u>Participant Boaters</u>	<u>Spectator Boaters</u>
NISS '82	0.95	0.65	0.88	0.88	1.16	1.11
WBS '82	1.0	1.0	1.36	1.36	1.11	1.11
PBS '82	1.04	1.34	0.88	0.94	0.73	0.79
BIRW '86		(1.001*)	1.59	1.67	0.93	0.89
Brenton '85		(0.999*)	1.17	1.14	1.05	1.11

*Indicates a common price index for tourists and residents; IProduct for NISS, WBS and PBS were calculated as follows:

Both Resident & Tourist IProduct = $I_{\$} * I_w * I_p$ (general public);

for the Race Events, BIRW and Brenton, IProduct = $I_{\$} * I_w * I_p$ (participant boaters).

VII.2.1.2 Estimating the Participation Submodel

To estimate the coefficients of the participation submodel, equations 7.2.1 and 7.2.2 were estimated using the actual attendance and data (indexes) provided by previous events and a dummy variable for tourist visitors.

The results of the estimated participation model for boat shows is presented in Table VII.5. The signs of the estimated coefficients (except the coefficient for weather index) were consistent with expectations. However, the estimated variances of these estimates are high, probably because of severe data limitations. However, perception seems to have the strongest influence on participation. The empirical fit of the models to actual visitor-days for boat shows are displayed on panel B of Table VII.5. Attempts to obtain subjective estimates for these past boat shows from past recordings and newspaper coverage were fruitless. Thus, it has not been possible to synthesize estimates from the participation model and judgmental sources at this point in time.

The results of the estimated participation function for boat races is presented in Table VII.6. The sign on perception is incorrect. However, it is highly significant. The impact exerted by the dummy coefficient is also significant.

The synthesis of prediction models which is based on the axiom of maximum information usage is accomplished by

Table VII.5 Results of Estimated Participation Function for Boat Shows.

Dependent variable: $\ln$ Visitor-Days

PANEL A

<u>Variable</u>	<u>Parameter Estimate</u>	<u>Standard Error</u>	<u>T-Statistics</u>
Intercept	7.5024	0.5391	13.917
LIPR	2.3372	2.7336	0.855
LIPERS	3.5694	1.9675	1.814
LIWEDER	-1.0667	1.9066	-0.559
D ₁	1.1262	0.6911	1.629

$R^2 = 0.88$; Number of Observations = 6

LIPR = $\ln$ Price Index; LIPERS = $\ln$ Perception Index;

LIWEDER = $\ln$ Weather Index;

D₁ = Dummy on Tourist visitor-days.

PANEL B

<u>Event</u>	<u>Empirical Forecast</u>	<u>Actual</u>
NISS(Residents)	1781	2079
NISS(Tourists)	13336	11043
WBS(Residents)	1662	1063
WBS(Tourists)	5126	8394
PBS(Residents)	820	1100
PBS(Tourists)	1480	1100

PS NISS = Newport International Sailboat Show;

WBS = Wooden Boat Show

PBS = New England Power Boat Show

synthesizing subjective and empirical estimates of participation, using the ratio of the sum of the variances of the predictive models as weights. The formula for synthesizing forecasts has been given as

$$\left(\frac{\sigma^2_1}{\sigma^2_2 + \sigma^2_1} \right) F_1 + \left(\frac{\sigma^2_2}{\sigma^2_1 + \sigma^2_2} \right) F_2$$

where σ^2_{22} = variance estimate of the empirical model;
 σ^2_{11} = variance estimate of the subjective model;
 F_1 and F_2 are the empirical and subjective forecasts, respectively.

The number of observations in the empirical model is too small to justify use of the mean square error as the true variance of the estimated model. Also, it is not practical to obtain any subjective variance estimates for the individual subjective values with only one estimate. The problem then arises on the values of the weights (that is, the ratio of the variances) employed in the synthesis. As a result, we have assumed that both predictive values are unbiased and equal weights of 0.5 have been assumed to represent the variance estimates of both forecasts. However, it is expected that future studies would address this problem and be able to obtain realistic variance estimates for both the subjective and empirical forecasts.

The results of the synthesized forecast are presented on panel B of Table VII.6. It will be premature to conclude whether the empirical forecasts are better than subjective forecasts. It is not unreasonable that most expert opinions could be as good as the estimates obtained

Table VII.6 Results of the Estimated Participation
Function for Boat Races

Dependent variable = ln Visitor-Days

PANEL A

<u>Variable</u>	<u>Parameter Estimate</u>	<u>Standard Error</u>	<u>T-Statistics</u>
Intercept	6.9108	0.09296	74.34***
LIPERS	-9.3021	-1.0730	-8.669*
D ₁	1.7907	0.1302	13.751**

$R^2 = 0.99$; Number of Observations = 4

LIPERS = ln Perception Index;

D₁ = Dummy on Tourist boaters.

PANEL B

<u>Event</u>	<u>Empirical</u>	<u>Subjective</u>	<u>Synthesized Forecast</u> ^a	<u>Actual (Visitor Days)</u>
BIRW (Resident)	1970	1910	1940	1826
BIRW (Tourist)	11809	12730	12270	12603
BRENTON (Resident)	637	805	721	680
BRENTON (Tourist)	3819	6471	5145	3578

^aSubjective estimates were obtained from the expected number of yachts at the boat races.

through econometric modeling. Hence, it is important to synthesize all available sources of forecasts, more so, as that would enhance minimizing the degree of error in the forecasts.

VII.2.2 Subjective Estimates of Participation

A second group of models explaining the levels of participation could be obtained through "brainstorming." This procedure assembles the opinions of experts and business leaders who are asked to estimate participation and spending patterns. These experts would not be assembled at one place at one time. Rather, they are contacted at their convenience over an extended period of time. A considerable amount of unquantified subjective opinion usually is available from individual experts. In a practical context, decision-makers formulate their own intuitive synthesis in the absence of methodological guidelines.

The belief in obtaining expert forecasts on participation lies in the fact that it is not uncommon for event managers and/or sponsors to disclose what their expectations of participation are before the event occurred. To this end, prediction estimates of participation can be obtained from different experts on different events. The questionnaires described in Appendix B might be used to obtain this information.

VII.2.3 Synthesizing Participation Forecasts

The practice of forming a synthesis of forecasting method is a fundamental principle of Bayesian Decision Analysis. When part of the decision-maker's evidence is in the form of a variety of prediction methods, or expert opinions, Decision Theory requires him to formulate a synthesis of all the predictive models. The methodology of combining forecasts is founded upon the axiom of maximum information usage. Thus, in a similar manner to Bunn (1975 and 1979) the present development of a practical method for the combination of forecasts concentrates upon the optimal minimum variance predictor.

To illustrate the minimum variance synthesis, we have to assume that the cost of forecast error is proportional to the square of the error; an assumption in all least squares estimation procedures. With such an orthodox assumption it is easy to show that the expected loss associated with a predictive model is proportional to its forecast variance. For example, suppose the empirical and judgment predictive models are assumed to give unbiased forecasts, F_{1t} and F_{2t} , where F_1 refers to the empirical forecasts and F_2 represents the judgment forecast from experts, and they have corresponding variances σ^2_1 and σ^2_2 . The minimum variance synthesis forecast is specified as

$$Y_t = w_t F_{1t} + (1-w_t) F_{2t}, \text{ where}$$

$$w_t = \frac{\sum_{t=1}^T \sigma_{2t}^2}{\sum_{t=1}^T (\sigma_{1t}^2 + \sigma_{2t}^2)}$$

There has been much confidence surrounding the use of the above approach for econometric time series, but the results obtained from such methodologies do not validate its use in any general sense. To establish validity in results, the Bayesian procedure of revising belief in the light of new information is a justified requirement. Hence a procedure of attaching prior subjective probabilities to each individual forecast and updating these probabilities as new information becomes available via Bayes' theorem provides a rational basis for combining forecasts. Also, if a rational inductive process entails the utilization of all the available information and hypotheses at any given time, then such a procedure of combining forecasts provides a valid operational formalization of rational inference on the future (Bunn, 1975).

VII.3 The Expenditure Submodel

Traditionally, economists view individual consumer expenditures as the result of the allocation of personal income to the number of goods available to the consumer. Economic theory suggests that prices, income variables, and other factors should be included as explanatory variables in expenditure models of event-visitors. If the consumer makes expenditure decisions in a step-wise manner, the first step will be decision of how much to

allocate to current expenditures out of current income and wealth and the second step is the decision of how to allocate current expenditures to particular goods and services or groups of goods and services.

It was not possible to model the entire budgeting allocation process down to the expenditures made at tourist events. This section describes the application of an approximation to the final two steps: an event expenditure model and an event budget allocation model. The major requirement of an allocation model is additivity. That is, predicted expenditure allocation in all major categories of goods and services must sum to total expenditure and percentage allocations for all items must sum to one. A logistic model was used here because it satisfies this requirement, it permits considerable flexibility, and can be estimated by least squares estimation techniques.

The general form of the event expenditure model is

$$\ln(\text{Event Expenditures}) = \beta_0 + \beta_1 \text{ days at the event} \\ + \beta_2 \text{ persons in group.}$$

The general form of the logistic model for the share of a total budget allocated to a specific good or service at the event is given by

$$w_i = \frac{e^{f_i(x)}}{\sum_{j=1}^N e^{f_j(x)}} \quad i \text{ and } j = 1, \dots, N \quad (7.3.1)$$

where w_i is the budget share allocated to the i^{th} good or group of goods, or
 $PEXP(i)/EXPTOT = w_i$ where
 $PEXP(i)$ = expenditure on i^{th} good or service;
 $EXPTOT$ = total expenditure; and
 X = explanatory variables.

In order to estimate the model, a number of restrictions were imposed on the general form. First, it was decided to limit the number of expenditure groups to two or three in this study for boat races. Boat expenses, personal, and other expenditures were the categories; for boat show visitors only the second and third categories were used. These groups might be extended as more information becomes available. A breakdown of the groups is:

- 1) Boat expenses - include expenditures on marina and docking, cleaning and repairs, and equipment and supplies.
- 2) Personal expenditures - include expenditures on meals, lodging and entertainment expenses.
- 3) Other expenditures - include transportation (gasoline and its tax, auto services, etc.) and miscellaneous expenses.

A second restriction made for the specification of the final expenditure model was to exclude prices of goods and services bought as explanatory variables. The primary reason for this restriction was the lack of data. Not only were prices and quantities unavailable, but also household discretionary income which could have been used to explain the purchasing power of individuals were

unavailable. Thirdly, the effect of location was considered to be negligible since all visitors' expenditures were incurred within the same local area.

There is a basic indeterminacy common to the parameters of all allocation models. If all $f_i(x)$ are linear in parameters, this indeterminacy takes the form of an unknown constant term added to the parameter of each variable across the N functions. The indeterminacy of the constant term results from the fact that we cannot distinguish it from all parameters across equations. As a result, the matrix of second order partial derivatives is singular. In general, the matrix of second order partials will be singular for T observations and K explanatory variables unless some restriction is imposed on the parameters. Therefore, to eliminate the indeterminacy all parameters of the N^{th} function $f_i(x)$ are restricted to zero where N is the number of expenditure groups present. Thus, the final model is reduced to $N-1$ identical equations.

The specification for the event budget allocation model uses number of persons in a group and the number of days spent at the event site as explanatory variables, just as did the event expenditure model. This specification is

$$w_i = \frac{e^{\beta_{i0} + \beta_{i1}\text{Days} + \beta_{i2}\text{Persons}}}{\sum_{j=1}^N e^{\beta_{j0} + \beta_{j1}\text{Days} + \beta_{j2}\text{Persons}}} \quad i=1, \dots, N \quad (7.3.2)$$

VII.3.1 The Data

The data used for the estimation of the model were obtained from a representative boat show and a representative race; that is, the Block Island Race Week (BIRW) of 1986, and the Newport International Sailboat Show (NISS) of 1982. The survey of visitors to these events was made by Tyrrell (1983 & 1987).

Data collected from the survey were used for the assessment of the economic impacts from the event. Expenditure data from 492 surveyed visitors to the NISS and 102 skippers at the BIRW constituted the data set used in this study. The observations for the NISS were divided into two groups--Rhode Island residents and non-Rhode Island residents, herein called tourists, and their respective expenditure functions estimated. However, about five percent of the tourist observations were eliminated because the visitors came either from foreign countries or outside the northeast region which is being emphasized as the market area for Rhode Island short-term events. Because of limited amount of data in BIRW of 1986, it was not possible to separate Rhode Island

residents and tourists for the purpose of estimating their expenditure functions.

VII.3.2 The Results

Two models each were estimated for residents and tourists at the 1982 NISS. In Table VII.7 the results of the total expenditure per person-day for Rhode Island residents are presented. The sign on the estimated parameter of persons is consistent with a priori economic theory and significant. This suggests that total expenditures per person per day would decrease as the number of persons per group increases because costs on dockfees, automobile maintenance and maybe meals are shared among the group. Thus, each individual visitor's total cost would decrease as the size of the group increases. The sign on the coefficient of day is expected to be negative for the same economies of scale reasons. The results show

Table VII.7. Estimated Results of Total Expenditure Function for Rhode Island Residents

Dependent Variable: $\ln \text{EXPTOT}$

VARIABLE	PARAMETER ESTIMATE	T-STATISTICS
Intercept	3.9695	7.189*
Day	-1.0034	-2.164*
Persons	-0.2799	-2.973*

R-Square = 0.184; Number of Observations = 64

F-Value = 6.870

DW = 2.173

EXPTOT = Total Expenditure per person-day.

*Indicates level of significance at 95% probability level.

that it is negative and significant. Specification error may be responsible for the low value of the R-square.

With the same explanatory variables, an event budget allocation model was estimated. The results are contained in Table VII.8. The dependent variable in this case is the ratio of the proportion of "Other" expenditures to Personal expenditures. Only two groups of expenditures were obtained from the visitors to the NISS, personal and other expenditures. Therefore, parameter estimates are obtained from a single log ratio function. None of the explanatory variables was highly significant. However, we have proceeded by using the estimated coefficients in Table VII.8 in predicting the expenditure pattern of Rhode Island residents not only at the NISS 1982, but also at other boat shows.

Table VII.8 Estimated Results of Budget Allocation Model for Rhode Island Residents

Dependent Variable: LPI

VARIABLE	PARAMETER ESTIMATE	T-STATISTICS
Intercept	0.4075	0.234
Day	-0.0905	-0.062
Persons	-0.3909	-0.1317

R-Square = 0.03; Number of Observations = 64
 F-Value = 0.870
 DW = 2.106
 LPI = Logarithm of (PROTEXP/PRHTEXP);
 PROTEXP = Proportion of "Other" expenditure;
 PRHTEXP = Proportion of Personal expenditure.

The results of the estimated equations of the expenditure function and allocation models for tourists at the NISS of 1982 are presented in Tables VII.9 and VII.10. The estimated coefficient of persons is of the right sign and significant. However, the coefficient on Days is counter intuitive and the R-squared is low, which suggests that some additional variable may be needed to further strengthen the relationship between total expenditure and the explanatory variables. The results obtained for the budget allocation model for tourists in Table VII.10 are similar to those of Rhode Island residents.

Table VII.9. Estimated Results of Total Expenditure Function for Tourists

Dependent Variable: $\ln EXPTOT$

VARIABLE	PARAMETER ESTIMATE	T-STATISTICS
Intercept	3.2511	19.017*
Day	0.4120	4.061*
Persons	-0.1912	-4.393*

R-Square = 0.092; Number of Observations = 361

F-Value = 18.110

$\ln EXPTOT$ = Logarithm of Total Expenditure per person-day

*Indicates level of significance at 95% probability level.

Table VII.10. Estimated Results of Budget Allocation Model for Tourists

Dependent Variable: LPI

VARIABLE	PARAMETER ESTIMATE	T-STATISTICS
Intercept	-0.5111	-1.213
Day	-0.2279	-0.894
Persons	-0.2114	-1.971*

R-Square = 0.013; Number of Observations = 361

F-Value = 2.322

LPI = Logarithm of (PROTEXP/PRHTEXP)

PROTEXP = Proportion of Other expenditure

PRHTEXP = Proportion of Personal expenditure

*Indicates level of significance at 95% probability level.

The results of the expenditure models for Block Island Race Week of 1986 are presented in Tables VII.11-VII.13. Because of the limited number of boaters that responded to the questionnaires, it was not possible to estimate different expenditure functions for Rhode Island residents and boaters. Thus, all boaters were treated as a single group or population.

Three models that are similar in structure were estimated. Table VII.11 presents the results of the total expenditure model per day per person for the boaters. The sign on the estimated coefficient of persons violates the a priori assumption that expenditures decrease as the number of persons per boat increase. It is also not significant. However, persons as an explanatory variable is an important variable in determining the total expenditure levels of boaters since total expenditure is assumed to be shared among the crew members, and is made

up of boat expenses, personal and other expenditures. Individual crew members may be responsible for their personal and other expenses, but boat expenses are frequently paid by the owner/skipper of the boat. The latter expenses are determined by size and other characteristics not accounted for by the model. Therefore, the expected sign on the estimated coefficient of persons cannot be determined a priori.

As expected, the sign on Days is negative because of economies of scale arguments, and it is significant.

Table VII.11. Estimated Results of Total Expenditure for Block Island Race Week 1986 Boaters

Dependent Variable: LEXPTOTA

VARIABLE	PARAMETER ESTIMATE	T-STATISTICS
Intercept	4.5548	10.917*
Days	-0.1945	-3.149*
Persons	0.0245	1.480

R-Square = 0.09; Number of Observations = 102

F-Value = 5.329

LEXPTOTA = Logarithm of total expenditure per person-day.

*Indicates level of significance at 95% probability level.

The number of persons per boat usually is determined by the rating of the boat. The International Offshore Rating Association has the sole responsibility of classifying boats. Most often the criteria adopted in such ratings include the length, speed and design, and some other technical features of the boat.

The ratings of the different categories of boaters that participated in the event were added to the model as an explanatory variable, however, the fit of the model did not change and rating was dropped out of the model.

Three categories of expenditures were considered: boat expenses, personal expenses and other expenses. The proportion of the total budget share of Other expenditures has been used to normalize the estimation of the budget share equations.

The results of the log budget share of boat expenses to other expenses is presented in Table VII.12. The estimated coefficient on days is positive and significant at 90% probability level, indicating that the relative proportion of expenditures on boat expenses increases with the number of days spent at the race. The sign on the coefficient of persons is negative and almost significant at 90% probability level. This indicates that the relative proportion of expenditures on the boat decreases with the number of persons.

Table VII.13 shows the estimated results of log budget share of personal expenditures to other expenditures for BIRW 1986. The estimated coefficient of persons is positive and significant at 95% probability level. This suggests that the relative proportion of personal expenditures increases with the number of persons. The coefficient on days is negative and insignificant,

indicating that the relative proportion of personal expenditures is unchanged over the length of the stay.

The statistical results of the expenditure functions listed and explained in the previous section permit us to explain and be able to predict budget shares by composition and levels of total expenditures. Total expenditures' projections can be derived from appropriate projected values for the independent variables and the relevant coefficients of the expenditure functions. This will give the total predicted expenditures, in dollars, for individual participants in the short-term event specified. Similarly, projected values of the explanatory variables in the budget share model would give the predicted ratio of the proportion of expenditures to a particular expenditure category.

Table VII.12. Estimated Results of Total Budget Share of Boat Expenses for the Block Island Race Week 1986 Boaters

Dependent Variable: LPI

VARIABLE	PARAMETER ESTIMATE	T-STATISTICS
Intercept	-2.4964	-1.817*
Days	0.3820	1.928*
Persons	-0.0850	-1.605

R-Square = 0.05; Number of Observations = 100

F-Value = 2.755

LPI = Logarithm of the ratio of PREXPD and PREXPM;

PREXPD = Proportion of total budget share allocated to "Boat Expenses" expenditures;

PREXPM = Proportion of total budget share allocated to "Other" expenditures.

*Indicates level of significance at 90% probability level.

Table VII.13. Estimated Results of Total Budget Share of Personal Expenditures for the Block Island Race Week 1986 Boaters

Dependent Variable: LPJ

VARIABLE	PARAMETER ESTIMATE	T-STATISTICS
Intercept	1.2697	1.699
Days	-0.1355	-1.257
Persons	0.0642	2.229*

R-Square = 0.05; Number of Observations = 100

F-Value = 2.930

LPJ = Logarithm of the ratio of PREXPH and PREXPM

PREXPH = Proportion of total budget share allocated to "Personal" expenditures

PREXPM = Proportion of total budget share allocated to "Other" expenditures.

*Indicates level of significance at 95% probability level.

VI.4 The Impact Assessment Submodel

The predicted economic impact of a short-term event is the total sum of expenditures on Rhode Island goods and services by visitors and sponsors of Rhode Island short-term events as estimated by the products of estimated participants and average expenditures from the other submodels. These constitute the direct economic impact of an event. The impact assessment submodel provides the final estimates of the effects of the event.

When Rhode Island residents and businesses receive these income payments, they respend them on other goods and services in the state (including wages), and there is a second round of benefits which should be added to the first. The implication is that more jobs and higher wages than otherwise would have been created. More and more

leakages out of the state economy occur in each round of respending until a round when "value added" is effectively zero. The sum of these income impacts after many rounds of respending is the total (direct plus indirect) income impact of the event. This impact is usually computed by a theoretically derived "income multiplier" which is applied to net direct spending.

Indirect expenditure, triggered by these direct expenditures, would be generated using multipliers from Washington County Input-Output (I-O) model. This I-O model is generated by an Input-Output Analysis System for forest service planning (IMPLAN), developed at Land Management Planning unit of forest Science, Fort Collins, Colorado. IMPLAN provides planning analysts with the capability to construct non-survey regional Input-Output models. The system consists of a data base and a software to build models for any area as small as a County in the U.S., and an analysis program to interact with the model.

A highly disaggregated 466 sector Input-Output model has been constructed for Washington County using the IMPLAN. This Input-Output model is converted to a predictive mathematical model (standard Leontief inverse model) by use of the inverse program. IMPLAN gives five groups of multipliers that describe the response characteristic of regional economy to external changes in demand. They are: output multipliers, personal income

multipliers, total income multipliers, value and added multipliers.

In this study, output multipliers are used to evaluate the indirect, induced and total economic impact of tourism expenditures in Rhode Island. Output multipliers are units of measurement for total sales and are usually referred to as final demand multipliers. They represent simple indicators of interdependence among industries within a region. IMPLAN gives Type I and Type III output multipliers. Type I measures the direct and indirect expenditures while Type III evaluates the total economic impact (direct, indirect and induced). The industry sectors chosen to correspond with the expenditure categories of the study are hotels and lodging establishments, eating and drinking places, auto repairs and services (transportation), retail trade (groceries), and amusement and recreation services. A list of these output multipliers used to evaluate the indirect economic impact is presented below:

Economic Impact Multipliers

Sector No.	Industry Sector	Type I	Type III
441	Hotel & Lodging Places	1.2171	1.6206
448	Transportation	1.2127	1.3989
450	Amusement, Recreational and other services	1.2601	1.7876

Source: Input-Output Analysis System for Forest Service Planning (IMPLAN), Fort Collins, Colorado.

The event participation and expenditure models developed in this chapter has been applied to a Rhode Island short-term tourism event, The Block Island Race Week, which ran from June 21 through June 27, 1987.

CHAPTER VIII

APPLICATION AND VALIDATION OF THE ECONOMIC IMPACT FORECASTING MODEL

In this chapter the economic impact forecasting model for short-term tourism events is applied to a representative event--the Block Island Race Week, June 21-27, 1987. Our concern in this chapter is with prediction, the object of which is to obtain estimates of the economic impact generated from such events, given additional information about the movement of the predictor variables used in this study. An event impact forecasting questionnaire (see Appendix B) completed by event managers is the source of the additional information.

In order to obtain estimates of economic impact forecasts, four types of analysis were performed:

- 1) The forecast for participation is made. This is accomplished by synthesizing the predicted estimates obtained from the empirical participation model and the subjective estimates of participation.

- 2) The expenditure forecasts are generated. Expenditures by visitors are assumed to be incurred in a step-wise manner. Therefore, the predicted values of

total expenditures are presented first, and the budget allocation forecasts are obtained.

3) The economic impact forecast is the product of the participation and expenditure forecasts. This forecast only accounts for the impacts generated by event visitors. Expenditures made on Rhode Island goods and services by event sponsors and promoters also constitute impacts to the state. The sponsors' expenditures are predetermined and could only be obtained from the event sponsor's budget. Therefore the direct economic impact for an event is the sum of the expenditures by the sponsors and the visitors to Rhode Island short-term events.

The state residents and businesses receive income payments for their goods and services, and respend them on other goods and services in the state (preferably). Thus, there is a second round of impacts and these are called indirect and induced impacts. Hence, the total economic impact of a short-term event is the sum of all the income impacts after many rounds of spending.

4) An additional step is the validation of the prediction model. Forecasts are useful policy tools if they are validated after all information is known with certainty. The reliability of the developed prediction model would therefore be validated with information from past events.

VIII.1 Forecasts for Participation at the 1987 Block Island Race Week (BIRW)

The forecast methodology for participation in the 1987 BIRW has been defined as:

$$Y_t = w_t F_{1t} + (1-w_t) F_{2t} ;$$

$$\text{where } w_t = \frac{\sum_{t=1}^T \sigma_{2t}^2}{\sum_{t=1}^T (\sigma_{1t}^2 + \sigma_{2t}^2)} .$$

Y_t = predicted value of participation and $t = 1987$.
The $\sigma_{i,}^2$, ($i=1,2$), are variance estimates of F_1 and F_2 , respectively. F_1 refers to the empirical participation forecasts and F_2 is the subjective or judgment estimates of participation levels obtained from event managers or experts. Once again, F_1 has been generated from the equation stated below:

$$F_1 = Q_0 I_p^\gamma ;$$

where Q_0 is a constant term, and I_p is the index of perception for the race events used in this study.

VIII.1.1 Generating the Indexes for BIRW 1987.

Price Index

The price index for the 1987 BIRW, with predetermined entry fee for the event as \$375.00 per team, is estimated as:

$$I_\$ = \exp - \{b_1(X_1 + M^*) - (X_1 + M)\} \quad 8.1$$

where b_1 is the estimated coefficient of travel cost for boaters in Table VII.1. (-0.005);

- X_1 = the average cost of travel, a constant for all boaters (i.e., \$54.78)
 M^* = average expenditure per person-day at the previous boating event plus the average entry fee at the "average" boat race.

The average entry fee at the average event is the simple arithmetic average of previous entry fees at previous boating events. For uniformity, the average entry fee at event has been expressed on a person-day basis.

M = the predicted average expenditure per person-day for 1987 BIRW plus average entry per person day which is determined from \$375 (10×7) .

Thus, the average entry fee per person-day at BIRW 1987 is \$5.36.

One of the issues that arises is whether or not to deflate the entry fees for 1987. In price analyses, deflating often involves dividing the nominal prices by a price index to obtain real prices. Demand theory suggests that it is appropriate to deflate when all prices increase or decrease by the same percentage, and demand remains unchanged. This follows from the assumption of homogeneity, and where such scenarios exist, it is appropriate to deflate price in a linear demand equation by a general index of prices.

However, if changes in the general price level have an "illusion effect" on the demand of the event, then deflating is not necessary. An illusion effect means that the demand for the event changes in response to nominal prices even though real prices have not changed. Further-

more, deflating is unnecessary when the objective of the analysis is to predict or forecast revenue. Usually, one would want to forecast the nominal income, not a deflated income and such is the case here. Therefore, entry fees for the BIRW 1987 are not deflated to 1986 dollars as is the other variables used in the estimation of the price index.

The price index for the Block Island Race Week 1987 is therefore obtained by solving equation 8.1.

$$\begin{aligned} & \exp -\{-0.005(54.78+38.58+2.23) - (54.78+31.73+5.36)\} \\ & \exp -\{-0.005(95.59-91.87)\} \\ & \exp - (-0.005(3.72)) = 1.02. \end{aligned}$$

Therefore the price index for BIRW 1987 is 1.02.

Weather Index

The weather index for the BIRW 1987 is estimated as given in equation 6.3.5 :

$$\exp(b_1(T_e - T_m) + b_2(E_e - E_m) + b_3(R_e - R_m)) \quad 8.2$$

where b_1 , b_2 and b_3 are the estimated coefficients of temperature, evaporation and rainfall adopted from Timothy 1984;

T_e = projection of average temperature during the event;

T_m = projection of average monthly temperature;

E_e = projection of evaporation reading during the event;

E_m = projection of monthly evaporation;

R_e = projection of proportion of rain days during the event;

R_m = projection of proportion of rain days in the month of the event.

It is difficult to project weather conditions. In order to obtain plausible readings for the adopted weather variables, historical weather data from June 1980 - June 1986 have been collected and a simple average of the relevant weather variables obtained. It is our hope that these averages provide meaningful estimates of the weather conditions for the month of June 1987, and also the period of the event.

The weather index for BIRW 1987 is therefore obtained by solving equation 8.2, given our forecasts for June 1987's temperature, evaporation and rainfall or precipitation from historical data. Thus, for Rhode Island resident boaters at BIRW 1987, the weather index is:

$$\begin{aligned} I_w &= \exp(0.0872(73.12-70.41)-1.3991(0.04-0.30)) \\ &= e(0.2363+0.0018+0.36) = e(0.60) = 1.82 \end{aligned}$$

Also, the weather index for tourists at BIRW 1987 is

$$\begin{aligned} I_w &= \exp(0.0699(73.12-70.41)+0.031(0.21-0.18)-1.305(0.04-0.3)) \\ &= e(0.189+0.001+0.34) = e(0.53) = 1.70. \end{aligned}$$

Perception Index

The perception index, I_p , for the Block Island Race Week 1987, has been calculated using the formula developed in Chapter VI. That is:

$$I_p = \left(\sum_{i=1}^n A_{oi}/n \right) \div \left(\sum_{i=1}^k A_{oi}/k \right);$$

where the first term represents the boaters attractiveness of BIRW as evaluated by n experts; and the second term is the attractiveness of the "average" boat race event, where k is the number of similar events across experts. Information used in generating this index is obtained from the completion of the event impact forecasting questionnaire, found in the Appendix B, by the event managers. Thus, the perception index for 1987 BIRW is 0.95.

VIII.1.2 The Forecast for Participation

The empirical participation forecast for BIRW 1987 is derived by multiplying projected perception index, in terms of logarithms, by the relevant coefficient of Table VII.1, summing the results and taking the antilog. The participation forecasts are therefore derived as follows:

A. Tourist Visitor-days:

$$e(6.9108 - 9.3021 * \ln 0.95 + 1.7907 * 1) = 9687.9;$$

B. Rhode Island Resident Visitor-days:

$$e(6.9108 - 9.3021 * \ln 0.95 + 0) = 1597$$

Subjective estimates of participation were obtained from the event manager. Two hundred and fifty three Northeast yachts were expected to participate in the races. Rhode Island resident yachts were expected to be about 13% of the expected total number of yachts. The expected average number of persons per boat is 10 and each team member is expected to stay an average of 7 days in Rhode Island. From these estimates, the subjective

estimates of visitor-days are derived as 15,400 for tourists and 2310 for R.I. residents.

To synthesize the empirical and judgment forecasts, it is assumed that the results of both forecast models produced unbiased results. Because of the difficulty in obtaining plausible variance estimates for the empirical and judgment forecasts, equal weights of 0.5 have been assumed to represent the variances of the models. Thus, the synthesized participation forecast for BIRW 1987 is:

1. Tourists

$$.5(9687.9) + 0.5(15400) = 4844 + 7700 = 12544$$

and this is equivalent to about 180 tourist boats.

2. Rhode Island Residents

$$.5(1597) + .5(2310) = 799 + 1155 = 1954$$

and this is equivalent to about 28 Rhode Island resident boats.

VIII.2 Visitor Expenditure Forecasts for BIRW 1987

The forecasting model for expenditures of event visitors is defined generally by

$$\ln(N_p) = b_0 + b_1 \text{Day} + b_3 \text{Persons};$$

where N_p = predicted expenditure.

Projections of the explanatory variables have been obtained from the event managers through the completion of the event impact forecasting questionnaire. The average number of persons per boat is expected to be 10 for BIRW 1987, and the projected average number of days spent by

each participant boater is 7 days. Two hundred and fifty-three teams are expected to participate in the event.

In predicting the total expenditure for BIRW 1987 we begin by making the assumption that the estimated parameters of the total expenditure function in Table VIII.2 are correct. The appropriate forecast for total expenditure is therefore

$$\ln(N_p) = 4.5548 - 0.1945(7) + 0.0245(10).$$

The predicted total expenditure per person per day at the 1987 Block Island Race Week is therefore the antilog of N_p . That is, antilog of 3.44, which is \$31.34. This value is, however, in 1986 dollars. In order to obtain the predicted value of total expenditure in 1987 dollars, the 1986 dollar value of \$31.34 is inflated by the compound rate of growth of inflation. The compound growth rate of inflation is hereby defined as the log of the ratio of the annual consumer price indexes (not seasonally adjusted) between January 1986 and January 1987. Thus, the inflated total expenditure for 1987 BIRW is \$31.73.

The log transformation of the estimated model introduces some bias into the estimated model. To adjust for the bias in the predicted results Goldberger (1964, p. 218) suggested the use of

$$E(\text{antilog } X) = (\text{antilog } EX) (1 + \text{SIGMA}/2),$$

where EX refers to the expected value of X and SIGMA = 0.367 is the variance of the estimated model. Therefore,

the predicted value of total expenditure per person per day is \$37.55, and the predicted total expenditure per team at the event will be \$2,628.50.

Expenditure by visitors on Rhode Island goods and services are assumed to be incurred in a step-wise manner. The next step therefore is to predict how visitors allocate their expenditures between different Rhode Island goods and services. In Chapter VII, the number of expenditure groups were identified as boat expenses, personal, and other expenditures. These constitute the major areas in which visitors spend their money.

To avoid singularity of estimated parameters for these major groups, two budget allocations models were estimated and the results were presented in Tables VII.12 and VII.13. The results of the estimated parameters are assumed to be correct and are used in the budget allocation predictions.

The estimated result of the budget share for boat expenses is

$$LPI = -2.4964 + 0.3820(7) - 0.0850(10),$$

where $LPI = \log$ of the ratio of $PREXPD$ and $PREXPM$;

$PREXPD = \text{Boat Expenses/Total Expenditure}$;

$PREXPM = \text{Other/Total Expenditure}$.

The predicted ratio of $PREXPD$ and $PREXPM$ is the antilog of the results obtained from above. That is 0.51. Also, the estimated result of the budget share of Hotel expenditures

is

$$LPJ = 1.2679 - 0.1355(7) + 0.0642(10)$$

where LPJ = log of the ratio of $PREXPH$ and $PREXPM$;

$PREXPH$ = Personal Expenditures/Total Expenditures.

the predicted ratio of $PREXPH$ and $PREXPM$ is the antilog of the result obtained from solving above. That is 2.58.

The predicted share of the total budget allocated to different expenditure categories (boat expenses, personal, and other) are calculated. To simplify the calculation of the predicted budget shared, we have expressed the predicted ratios as:

$$LPI = \frac{P_1}{P_3} = \frac{PREXPD}{PREXPM}, \text{ and}$$

$$LPJ = \frac{P_2}{P_3} = \frac{PREXPH}{PREXPM}.$$

By additivity, $P_1 + P_2 + P_3 = 1.0$. The results of the predicted proportions and their corresponding dollar amounts are presented in Table VIII.1.

Table VIII.1. Expenditure Forecasts by Categories Per Team

Expenditure Category	Predicted Proportion	Average Expected Expenses
Boat expenses	0.12	315.42
Hotel expenses	0.64	1682.24
Other Expenses	0.24	630.84
Total expenditure	1.000	2628.50

The above results reveal that visitors expenditure on hotel and lodging would constitute more than 60% of each team's total expenditure. This is in consonance with the trend of visitors expenditure at tourist events, as the bulk of expenses are incurred at eating and drinking places. Also, the model predicts that other miscellaneous expenses such as gifts, groceries and souvenirs would account for 24% of expenditure and boat expenses is expected to be around 12% of visitors expenditure.

VIII.3 Total Economic Impact Forecast of the Representative Event

VIII.3.1 Direct Economic Impacts

Tables VIII.2 and VIII.3 summarize the expected economic impacts from the Block Island Race Week of 1987. Table VIII.2 describes the economic impact by participant boaters (residents and tourists) for the entire period of the event, while VIII.3 describes the individual boat impacts at this event.

The direct economic impact of an event is composed of the impact from the participant expenditures, expenditures by press corps covering the event, and event sponsorship dollars in the State. Our economic impact forecasting model has been specifically designed to measure the impacts from the participant expenditures only. In order to obtain a fair estimate of the total direct impact from

such events, expenditures by the sponsors and press corps must be included.

The expenditure pattern of the sponsors and organizing committee can only be projected by the organizers and sponsors themselves. Based on previous amount of dollars spent by sponsors on such events, an ad hoc estimate of \$80,000.00 has been adopted as the total amount of money committed to the event's activities by the sponsors and organizing committee.

Most of the estimated \$80,000.00 is expected to be received from the visitors purchases of bracelets which serve as identification for the event's activities. The cost of these bracelets is predetermined by the sponsor and valued at \$35.00 per boater. This is not part of the entry fee and therefore is optional. Since the subjective estimate of participant boats expected at the event is 253 boats and each boat is expected to have an average of 10 persons, then the total of money collected from the sale of bracelets will be \$88,550.00 ($253 \times 10 \times 35$). In addition to this is the personal expenses of the organizing committee. The 1986 BIRW impact study by Tyrrell estimated that the expenses of the members of the organizing committee were around \$7,000.00. It is assumed that the organizing committee is expected to spend at least \$7,000.00 for BIRW 1987 as well. Additional contributions are expected to be made by sponsors in financial support

Table VIII.2. Participant Boaters Total Expenditure
During the Block Island Race Week 1987.
(In 1987 U.S. dollar)

Expenditure Category	R.I. Resident Boaters	Tourist Boaters	Total
Boat Expenses	8,804.724	56,523.264	65,327.99
Personal Expenses	46,958.528	301,457.408	348,415.94
Other Expenses	17,609.448	113,064.528	130,655.97
Total	73,372.70	471,027.2	544,399.9

Total amount of money spent by boaters = \$544,399.9

Table VIII.3. Individual Boat Expenditure During the
BIRW 1987.

Expenditure Category	R.I. Resident Boaters	Tourist Boaters	Total
Boat Expenses	314.45	315.42	523.17
Hotel	1,677.09	1,682.24	3,359.33
Other	628.91	630.94	1,259.85
Total	2,620.45	2,628.5	5,142.35

Total amount of money spent by each boat = \$5142.35

of the event. It is therefore expected that total expenditure by the sponsors of the BIRW 1987 could be more than \$100,000.00. Our estimate of \$80,000.00 is therefore a fraction of the expected sponsors' expenditure which is spent on Rhode Island goods and services and "in kind" donations. Thus, it constitutes an impact to the State. Included in the expenditure from this budget on Rhode Island goods and services are fees to the Champlin's Marina, computer rental, staff expenses and miscellaneous supplies and services purchased in the State.

There are also several photographers, free lance writers, and TV camera crews at such events. This group belongs to the press corps. It is estimated that each of these persons would spend about \$100 per day. Assuming that there were 10 pressmen and each stayed on the island for an average of 3 days, total expenditures by the press will be \$3,000.00. These expenditures also constitute an impact to the State.

The Block Island Race Week is not a spectator event. Therefore no spectators, except those related to the crewmen, are known to be present. During the races, few Rhode Island boats carrying local residents could be observed. These are not considered part of the race week. Thus, no spectator expenditures are attributable to this event.

Table VIII.4 itemizes the expected expenditures by the different spending groups expected at the Race Week.

Therefore, the expected economic impact from the Block Island Race Week of 1987 is about \$627,400. All of the expenditures identified as direct revenue impacts on the State cannot be considered equally valuable to the State economy. Dollars earned by local business go into wages, profits and goods to be sold. Certainly profits and wages paid to local residents are more valuable to the State than goods purchased out-of-state.

Table VIII.4. Direct Economic Impact of the BIRW
by Type of Spending Group

Spending Group	Total Amount (\$)
Tourist Boaters	471,027.20
R.I. Resident Boaters	73,372.70
Event Sponsorship in State	80,000.00
Press	3,000.00
Spectators	0
Total	627,399.90

Value added by event 70% of 627,399.90 = \$439,179.93

Therefore a better measure of the value of the event is "local value added" which represents payments for the services of local capital (interest), land (rent) and labor (salaries, wages and profits). This concept eliminates purchases on non-Rhode Island goods and services from the definition of value and translates directly into the buying power of the local residents and businesses. A study of the Block Island Race Week of 1971 by Farrell

estimated "local value added" to be 70% of the total direct expenditures and we have used that estimate here as well. Therefore, the value added or direct Rhode Island income generated by the event is expected to be \$439 housand.

VIII.3.2 Indirect Economic Impact of Expenditures at BIRW

Tables VIII.5 and VIII.6 summarize the expected indirect economic impacts generated from the Block Island Race Week of 1987. These sales are generated by respending of dollars received from participants and are categorized as indirect, induced and total indirect impacts (indirect and induced). Total impacts expected from personal expenditures are the largest.

Visitors' expenditures in personal would generate \$75,641.10 sales in the State. This expenditure category includes dollars spent in eating and drinking places, and lodging. Dollars spent by visitors on "Other" expenditures such as recreational amusement, gifts, souvenirs, and groceries is expected to create an additional \$33,983.62. Also, expenditures on boat expenses would generate an additional indirect impact of \$13,895.26.

In summary, participants' expenditures at the Block Island Race Week is expected to generate a total impact of \$1,013,110.21, that is the sum of total, indirect and induced impacts.

VIII.4 Validation of Forecasts

The validation of the economic impact forecasting framework is very important because forecasts generated from such procedures would be useful in the planning and allocation of resources if they are validated. At the present time, actual data on visitors expenditures are not available. Hence the 1987 economic impact forecast could only be validated when that information becomes available. Meanwhile, the forecasting framework could be validated by predicting the economic impact from a past event which was not originally included in the formulation of the forecasting procedure. Ideally, a validation technique would involve predicting one event while excluding it from the data set used in the prediction model. This has not been possible because of too few observations. Hence we proceed with testing the reliability of the model by predicting direct impacts from expenditures by participants at the Block Island Race Week of 1971.

First, the empirical participation forecast developed was expressed as:

$F_1 = Q_0 I_p^\beta$; where Q_0 is the constant term, I_p is the index of consumers' perception as evaluated by experts and β is the estimated coefficient of that index.

Table VIII.5. Indirect Economic Impact of Event
Participant Dollars at the Block Island
Race Week 1987.

Expenditure Category	Indirect Impact
Boat Expenses	13,895.26
Personal Expenses	75,641.10
Other Expenses	33,983.62
Total	123,519.98

Figures generated from Participants Total Expenditures in
Table VIII.2.

Table VIII.6. Induced Economic Impact of the Block
Island Race Week 1987

Expenditure Category	Induced Impact
Boat Expenses	26,059.34
Personal Expenses	216,226.35
Other Expenses	102,904.64
Total	345,190.33

Figures generated from Participants Total Expenditure in
Table VIII.2.

Estimated equation:

for tourist boaters:

$$e(6.9108-9.3021(\ln 0.95)+1.7907)) = 9668$$

for Rhode Island resident:

$$e(6.9108-9.3021(\ln 0.95)) = 1597.$$

We assume that the index of perception is the same for both the 1987 and 1971 BIRW. There is some truth to this assumption because it is possible that the same class of boaters are invited annually for the event. Therefore, the empirical participation forecasts are 9688 and 1597 visitor-days for non-local and local boaters, respectively. Thus, our model predicts that there were 11,285 total visitor-days at the Block Island Race Week 1971.

The economic impact assessment of the 1971 event reported by Joseph F. Farrell stated that 209 boats were expected at that event. Each boat had an estimated number of six persons per boat and the event ran for eight days; i.e., June 19 to June 26 inclusive. Thus the subjective estimate of the number of visitor-days is 10,032 total visitor-days (i.e., $209 \times 6 \times 8$). The expected number of boats or boaters from Rhode Island is unknown to the researcher. Therefore the synthesized forecast of the empirical and subjective estimates is

$$0.5(11285) + 0.5(10032) = 10658.5 \text{ total visitor-days.}$$

Again, we assumed that both types of forecasts are

unbiased, hence, equal weights of 0.5 are assigned to each forecast for illustrative purposes.

Expenditure estimates from the 1971 BIRW as reported by J. F. Farrell were \$650 per boat. Included in that estimate were expenses on marina fees, restaurants, eating and drinking places, groceries, souvenirs, and miscellaneous items such as tips and phone calls. Given the expenditure estimate of \$650.00 per boat, the predicted direct economic impact from the expenditures of the boaters would be \$144,333.85 (i.e., 222 boats x \$650; the number of boats is obtained by dividing 10658.5 visitor-days by 48--the average number of persons per boat and the number of days of the event). The predicted direct impact compares favorably to the \$127,400.00 generated from the event as evidenced by Farrell. There were 196 boats present at that event.

However, it must be noted that the perception variable is highly complex. The realization of many of the attributes of the event by the experts may not be observed visually by the participants at the events and this can lead to institutional constraint on the sponsor's production of tourism events. As a result, it has been suggested that the Fishbein Attitude Model should be used to generate actual indexes of perception of the consumers in the future.

CHAPTER IX

SUMMARY AND DIRECTIONS FOR FURTHER RESEARCH

IX.1 Summary

An attempt has been made to develop an economic impact forecasting framework for short-term tourism events. A representative boat race--the Block Island Race Week of 1987--was selected and its economic impacts predicted.

The economic impact of a short-term tourism event has been defined as the total sum of expenditures on Rhode Island goods and services by visitors to and sponsors of such events. Currently, data for the various types of spending groups present at a short-term event are scarce. Consequently, the predicted economic impact for the representative event has focused on expenditures only by the participant boaters and the sponsors of the event. Even though estimates of expenditures by the press corps has been included in the impact statements, such estimates are preliminary because they have been based on data from other events.

Of major concern are projections of participation levels for short-term tourism events. The need for such projections stems from the fact that the public planning and budgetary allocation process requires knowledge of the demand of specific short-term events in order to allocate

scarce resources efficiently. An ideal event participation model is expected to be a function of advertising, prices, consumers' perception and weather conditions. Due to severe data limitations, a complete participation model is currently inestimable. Consequently, the influence of explanatory variables were estimated independently.

A logistic travel cost technique was used to estimate the demand functions for the Block Island Race Week (BIRW) and the Newport International Sailboat Show (NISS). Because of the configuration of the population sampled at boat shows (NISS), similar demand functions were estimated for out-of-state visitors as well as for Rhode Island residents. The demand functions for other boat races and boat shows were assumed to resemble those estimated for the BIRW and NISS respectively. The influence of price was calculated from these estimated demand models.

The estimation of weather indexes involved the adoption of Timothy's 1984 model in which the influence of weather on participation was estimated. However, weather may not have a significant influence on all short-term events. Participation in indoor events would be less unaffected by adverse weather conditions. Also, the impact of weather seems to be slight at boat races since the worst possible scenario only involves a delay of the racing event. Therefore, forecasts of participation at different events should be driven only by those variables

whose influence are justified. For example, the present study has suggested that participation at boat races is mainly influenced by perceptions of boaters.

Consumers' perception has been obtained from experts' evaluation of how consumers perceive different events. Estimates obtained here are preliminary and it is expected that future studies of events should endeavor to obtain individual consumer perceptions of an event's attributes. The Fishbein's behavioral framework is well suited to do this and is presented in Appendix D.

In order to take advantage of expert judgment, the prediction approach involved the synthesis of subjective and empirical forecasts. The variances of each provides the weights.

The expenditure of visitors to Rhode Island short-term events has been specified to be a function of the number of persons traveling together in a group and the number of days spent at the event. Assuming that visitors budget their expenditures in a step-wise manner, the first decision will involve how much to allocate to current event expenditures out of current income and wealth and the second step is the decision of how to allocate expenditures to different goods and services or group of goods and services. The expenditure groups in the 1987 Block Island Race Week were categorized into three broad areas, viz the boat expenses, personal expenses, and other

expenditures. Expenditure forecasts for these groups were computed.

Since economic impact is the total sum of expenditures by visitors to Rhode Island short-term events, the impact forecast for the 1987 Block Island Race Week (the representative event) is the product of the participation and expenditure forecasts. Economic forecasts are useful tools of planning if such forecasts are validated. To validate the forecasting procedure, an external validation technique was used. Under this scenario, information on a past event, not included in the formulation of the prediction model, was used in predicting the impact from that event, given the estimated parameters of the forecasting methodologies.

In the future it will be important to develop an updating scheme for the predictor models. It is not uncommon to have unacceptable forecasts from well developed models. This may be attributed to inadequate and insufficient data sources or changing behavioral relationships. Hence, it is necessary to update the forecasting model and procedure as more information on future events becomes available.

IX. 2 Topics for Further Research

One of the weaknesses of the economic impact forecasting framework is the inadequacy of data. The Department of Resource Economics at the University of Rhode

Island is continuing to conduct studies of short-term events in the expectation of eventually performing a full empirical analysis.

Extensions to the forecasting procedure should include other predictor variables such as advertising, substitutes and complements. Also important is the target market area of different short-term events. Although this study assumes no substitutes, it is important to explore the wide range of substitute events which may attract visitors away from specific Rhode Island events. Also important is the role played by complementary tourist and recreational facilities. The availability of complementary attractions is an important factor in modeling consumer behavior. For example, the photogenic characteristics of the Rhode Island shoreline make it more suitable for spectator and media events. Also, evidence shows that the elegance and beauty of the Newport Mansions influence the decisions of many visitors to participate in Rhode Island events. Therefore, the extent to which the availability of complementary attractions and substitutes affect visit behavior needs additional study.

The Economic Impact Forecasting Model developed makes use of data provided by the visiting public at the Newport International Sailboat Show of 1982 and participant boaters at the 1986 Block Island Race Week. Besides these groups, other spending groups are present at different

short-term events. In order to facilitate the economic assessments of impacts from short-term events, it may be useful to construct a typology of events. Four possible types of events that are distinguishable in Rhode Island are listed below with major spending groups present at each.

A Tentative Typology of Marine-Related Events

<u>Boat Show</u>	<u>Boat Race</u>	<u>Media Event</u>	<u>Other Events</u>
Exhibitor Sponsors Gen. Public: .Spectator boaters .Visiting public .Trade patrons .Press corps	Participant Boaters Sponsors Gen. Public: .Spectator boaters .Family members of boaters .Press corps	Exhibitor (incl. ship's crew) Sponsors Gen. Public: .Spectator boaters .Visiting public .Press corps Participant boaters	Includes: Rendezvous- boat owners conference. Newport Jazz Festival Tuna Tourna- ment of Narragansett Sporting events like baseball baseball, football, etc. Performing Arts. Christmas Events.
<u>Examples:</u> Newport International Sailboat Show, Wooden Boat Show, Power Boat Show, Small Boat Show, etc.	<u>Examples:</u> Block Island Race Week, Newport- Bermuda Race, All types of Regattas	<u>Examples:</u> The Tall Ships Event, America's Cup, Swarovski Maxi Boat Regatta.	

This study has focused only on boat shows and boat races because data provided from such events were available. The details of the spending groups at "Other" events are not currently available. However, the economic impact forecasting framework developed here could be applied to these other categories.

Expenditures by each group in Rhode Island goods and services constitute an impact to the State. For a comprehensive impact study, the author suggests the adoption of questionnaires such as those provided in Appendix A. To facilitate impact assessments, the suggested questionnaires should be given to the spectators and participants at the beginning of the event, and collected from the visitors before they depart. This can be accomplished with the help of the event managers.

The synthesis of the predicted participation forecasts also deserves further study. The weights assigned to empirical and subjective forecasts need to be developed further. The mean square error of the empirical model could serve as the variance estimate of the empirical forecast. But the number of observations used in this study is small. For the variance estimates of subjective forecasts, a pragmatic approach ought to be adopted which will require that experts give a range of values and their probabilities. This range can be converted into an estimated variance.

In the future, it would be useful to reevaluate the relationship of the prediction techniques used in this study and to delineate the different types of spending groups. Previous analyses suggest strongly that large economic impacts are generated from expenditures by visitors to Rhode Island short-term events. Equally

important are the negative aspects of such events. These are not well known. It is entirely feasible to include social and environmental impact analysis into an economic assessment framework. Such an evaluation will provide a comprehensive estimate of the gain derived from short-term tourism events.

APPENDIX A
SUGGESTED QUESTIONNAIRE FOR VISITORS TO
RHODE ISLAND BOATING EVENTS

SECTION A
SPECTATORS AND PARTICIPANTS

1. Where did your trip to the boating event originate from?
In R.I. (town) _____
Outside R.I. (town, state) _____
2. What type of spending group do you belong to
(indicate by checking the appropriate group)?
Trade Patron ____ Exhibitor ____ Participant Boater ____
Press ____ Spectator Boater ____
Relative to participant boater ____
3. How did you get to the boating event?
 - a. AIRPLANE _____
 1. What were airfares for your party? \$ _____
 2. What non-airfare transportation expenses will you incur in RI related to the boat show?
\$ _____. (This includes ferry, taxi, & car rental.)
 3. Any local air-transportation? \$ _____.
 - b. BOAT _____
 1. What will you marina and docking fees be while at the boat show? \$ _____
 2. How much do you expect to spend on fuel and any other boat related expenses in RI for the trip? \$ _____
 3. Will you incur any expenses for land transportation while here? _____
 - c. CAR _____
 1. Can you estimate your round-trip mileage?
_____ miles
 2. How much do you expect to spend on gas and oil (in RI) for the trip? \$ _____
 3. How much will you spend for parking during the boat show? \$ _____
 4. How much will you spend on bridge tolls?
\$ _____
 5. How much will you spend on ferry, taxi & car rental? \$ _____
4. If you traveled by boat or car, please estimate how many hours or minutes it took to get to the event site. _____

5. How many days will you attend the event? _____
6. How many persons are in your party?
 Adults (above 18 yrs.) _____
 Teenagers (10-18 yrs.) _____
 Children (less than 10 yrs.) _____
7. Was the event your only reason for making this trip?
 _____ (Yes = 100%); if not, approximately what
 percent of your reason was it. _____
8. How did you hear about the event? _____
9. I'm going to ask you a few questions about non-
 transportation expenses for this trip. Please answer
 on a total (not daily) basis for all the people in
 your party and all the days you will be here.
- a. Are you staying in a RI hotel or motel? _____ If
 YES, how much will you spend for lodging during
 your stay? \$ _____
- b. What do you estimate you will spend on meals for
 your party this trip? \$ _____
- c. How much do you expect to spend on entertainment
 --such as sightseeing, night clubs, etc. for your
 party? \$ _____
- d. Are there any other expenses you will have as a
 result of this trip--such as gifts, souvenirs,
 and other shopping (not admission costs)?
 \$ _____

IF VISITOR IS A PARTICIPANT BOATER, THEN ASK QUESTIONS 10
 AND 11.

10. Please give us your best estimates for the following:

Race Week Registration Fees:

Entry Fee.....	\$ _____
Expenditures on _____ Bracelets at \$35.00....	\$ _____
Mooring Fees.....	\$ _____
Marina and Docking Fees.....	\$ _____
Boat Charter.....	\$ _____
Cleaning, Patching and Repairs.....	\$ _____
Equipment and Supplies.....	\$ _____
Total	\$ _____

11. What Race Week division did it race in? _____

IF VISITOR IS AN EXHIBITOR, THEN GO TO SECTION B

SECTION B

EXHIBITOR SURVEY

Instructions

1. Itemize in the spaces below, those expenses your firm incurred as a result of participating at the Boat Show. If your firm was reimbursed for an expense by another firm do not include total expense.
2. Include only those expense items that were paid to Rhode Island firms or individuals and please try to estimate the % of these expenses that were paid to Newport firms and residents.
3. Do not include any expense item paid to the promoters of the Boat Show--these monies are being measured elsewhere.
4. Please estimate as best you can, your receipts at the show as well as those which you expect to occur as a result of the show. Again, be assured all responses will be kept confidential and anonymous--our only interest is aggregate impacts.

Questionnaire

I. TYPE OF FIRM (please check one):

- ☐ 1. Sailboat builder
- ☐ 2. Other boat builder
- ☐ 3. Sailboat hardware
- ☐ 4. General marine hardware
- ☐ 5. Motors & Engines
- ☐ 6. Construction & Repair materials
- ☐ 7. Gift Shop items
- ☐ 8. Education & Publication
- ☐ 9. Cleaners, Chemicals, Paints & Preservatives
- ☐ 10. Sails, Canvas, Cordage, Rigging
- ☐ 11. Navigation & Other Instrumentation
- ☐ 12. Other

Expenditures in
Rhode Island

II. TRANSPORTATION COSTS

- A. For boat (if any)
- B. For other exhibit material
- C. Other (personnel, etc.)

\$ _____

III. ADVERTISING EXPENSES

(if any) associated with participation
in the Boat Show

\$ _____

IV. EXHIBIT PREPARATION AND OPERATION	
A. Boat Launching & Commissioning	\$ _____
B. Marine Expenses incurred before show opened and after it closed	_____
C. Booth Construction	_____
D. Exhibit Furniture Rental	_____
E. Additional Telephone and Electrical Service	_____
F. Cost of Display Material (slides, brochures, etc.)	_____
G. Other Exhibit Expenses	_____
V. RHODE ISLAND LABOR	
Hired to assist at show, not included above.	\$ _____
VI. STAFF AND OTHER PERSONS	
A. Number of Staff Personnel	_____
Food, Lodging & Entertainment for Staff	\$ _____
B. Number of other persons receiving credentials	_____
Food, Lodging & Entertainment for Others	\$ _____
VII. OTHER EXPENSES NOT COUNTED ABOVE	\$ _____
VIII. SALES AT SHOW	
Total of all items	\$ _____
IX. SALES RESULTING FROM SHOW	
Excluding those counted in VIII	\$ _____

SECTION C
(ALL VISITORS)

Event Perception Survey

1. On a scale of 1 (bad) to 10 (good), how would you rate the following attributes of the event location and how important does each attribute have on decision to attend?

	<u>Strengths</u>	<u>Importance</u>
Overall attractiveness	_____	_____
Summer congestion	_____	_____
Cleanliness	_____	_____
Availability of complementary attractions	_____	_____

2. Did anyone think you should attend or not (check the most appropriate)?
 ___strongly agree ___moderately agree ___indifferent
 ___disagree ___strongly disagree
3. How much do you want to do what that person thinks you should do?
 ___very strongly ___strongly ___indifferent
 ___refused ___strongly refused.

APPENDIX B
TOURISM EVENT AND SITE PERCEPTION SURVEY

The following questions ask you to assign a point value (from 1 = bad, to 10 = good), to the attractiveness of certain short-term Rhode Island Tourism Events and certain Rhode Island Event Sites. We do not want your personal assessment of the sites and events but rather your opinion about the General Public's perceptions of their attractiveness.

Part A, below, asks about sites and Part B asks about certain short-term marine tourism events. Do not worry about the fact that certain sites mentioned in Part A are not suitable for the events listed in Part B. (The events listed are the only ones that have been studied yet.)

PART A

Please rate (from 1 to 10) the following sites according to the five criteria given as the row titles.

General Public Perception (not yours) Rate from 1 to 10 (E_{ij})

<u>Criteria</u> <u>i's</u>	<u>S I T E S (Jth Locations)</u>					
	<u>Newport</u>	<u>Provi- dence</u>	<u>Warwick</u>	<u>Block Island</u>	<u>South County</u>	<u>Blackstone Valley</u>
1) overall attractive- ness (10 = excellence						
2) summer traffic con- gestion (10 = no congest.)						
3) summer cleanliness (10 = very clean)						
4) avail- ability of complementary attraction (10 = un- limited attraction)a/						
5) avail- ability of complementary tourism facilities (10 = un- limited facility)b/						

Note: a) includes historical sites, museums, parks scenery etc; and b) includes restrooms, motels and hotels, shops etc.

PART B

Also on a scale from 1 (bad) to 10 (good), what is your opinion about the perceptions of the specific groups of participants about the following marine tourism events.

B₁

NAME OF EVENT	TYPE	PARTICIPANT BOATERS	SPECTATOR BOATERS	GENERAL SPECTATOR
1) America's Cup	boat race			
2) Admiral's Cup Trials	boat race			
3) Block Island Race Week	boat race			
4) Newport-Bermuda Race	boat race			
5) Swarovski's Cup Maxi Regatta, 1985	boat race/ spectator event			
6) The Tall Ships Event of 1976	exhibition/ spectator event			
7) Newport Internat'l Sail Boat Show	boat show			
8) Wooden Boat Show	boat show			
9) Power Boat Show	boat show			
10) RI Boat Show	boat show			

Thank you.

APPENDIX B

MARINE TOURISM EVENT IMPACT FORECASTING QUESTIONNAIRE

- 1) Name of event: _____;
Location _____; Dates _____;
- 2) How would you classify the above event (check the most appropriate);
Boat Race _____; Boat Show _____; Regatta _____;
Spectator event _____:
- 3) Admission or Entry fee:
Adult _____
child _____
- 4) Please estimate the expected number of visitors in the following categories, the percent of residents and average number of days per visitor at the event;
- | | <u>Total</u>
<u>visitors</u> | <u>% Rhode</u>
<u>Islanders</u> | <u>Average No..</u>
<u>of days.</u> |
|----------------|---------------------------------|------------------------------------|--|
| Boaters | ----- | ----- | ----- |
| Exhibitors | ----- | ----- | ----- |
| Trade Patrons | ----- | ----- | ----- |
| General Public | ----- | ----- | ----- |
- 5) If event is a Boat Race, please estimate the expected number of boats, the percent of non-RI resident boats, and the average number of persons per boat:
- Total number of boats _____; % non-RI Resident boats _____;
Average number of persons per boat _____.
- 6) On a scale of 1 = bad to 10 = good, what is your overall evaluation of how consumers perceive the following attributes of your planned location?;
- | Attractiveness
of location; | Summer traffic
congestion; | Summer
cleanliness; | Complementary
attractions; |
|--------------------------------|-------------------------------|------------------------|-------------------------------|
| _____ | _____ | _____ | _____ |
- Other tourism facilities;

- 7) Also on a scale of 1 (bad) to 10 (good), what is your opinion about the perceptions of the specific groups of participants about the event?.
- | Participant
Boaters | Spectator
Boaters | General
Public | Exhibitors | Trade
Patrons |
|------------------------|----------------------|-------------------|------------|------------------|
| _____ | _____ | _____ | _____ | _____ |

Questionnaire, page 2

- 8) How much will be spent in advertising and promoting the event, and what is the target market area

Dollar amount for promotion: _____

Target market area _____

Please describe your promotional campaign:

- 9) How much of the dollar amount for promotion will be spent on Rhode Island goods and services

_____.

- 10a) What other similar events are scheduled about the same time as this event?

- 10b) Do you think they will influence attendance of your own event?

Yes _____; No _____;

If your answer to 8b is yes, please estimate what percentage of your expected total number of visitors that would be influenced by the similar event;

_____.

APPENDIX C

ECONOMETRIC ESTIMATION OF DEMAND FUNCTIONS

The Clawson-Knetsch (CK) approach was adopted for estimating the demand function for specific categories of short-term tourism events at specific sites. The NISS of 1982 at Newport and BIRW of 1986 at Block Island represent our representative boat show and race events.

C.1 The Data Sources

The sample of individual visitors to the aforementioned events were zoned into their respective counties of origin. Travel costs from each zone to the event site are assumed to be sufficiently close in magnitude across members of the zonal population to justify neglecting any differences. Travel costs, TC, for each zone are calculated and we assume that TC represents the average cost of travel for each zone. While TC is termed the travel costs, clearly it could be regarded as the price paid by visitors in order to participate in any of the RI short-term events. Also, since the normal practice for the two representative events, used as examples in this study, is to charge an entry fee, it is added to the costs of travel to each zone. Thus, the price paid by visitors becomes the sum of travel costs and entry fee, plus other aspects

of expenditures, such as lodging, food, entertainment, etc.

Visitation rates defined as visitor days per capita are calculated for each zone or county. This is the ratio of visitor-days to population. Because we want to estimate market demand functions for events, zones with zero visitor-days were assigned the values of 0.0000001. A logistic regression was estimated and the dependent variable was the ratio of the proportions of visitors and non-visitors. Household per capita income for each zone as well as the percentage of the county's population completing twelve years of education for the NISS 1982, and sixteen years of education for the Block Island Race Week 1986, and travel costs were the explanatory variables.

Based on our formulation of travel costs in section 5.5.1, the travel costs for each of our zones were calculated as follows:

"Representative" Boat Show -- NISS 1982:

$$TC_{ij} = (\text{Distance}/4) * 2 * [(50 * 0.1025 / 2.45) + V_T] + M$$

where

TC_{ij} = Travel costs from origin i to event site j .

Distance = Travel time (in hours) from i to j in 15 minute units.

4 = Factor to change 15 minute units to fractional hours.

50 = Average miles per hour assumed.

- 2 = Round trip factor.
- \$0.1025 = average operating cost per vehicle per mile.
- 2.45 = Average number of passengers per vehicle.
- V_T = Opportunity cost of travel time, that is, one-third average hourly wage rate per zone for 1986.
- M = Average total expenditure.

The data for average operating cost per vehicle per mile was determined from the United States Department of Transportation data for 1979. These data were updated to 1986 dollars using CPI and represent an average for the past ten years, rather than the expenses of operating a new car. It includes only items such as repairs and maintenance, gasoline, oil and taxes on gas and tires, parking and bridge tolls. Because of lack of specific data it was assumed that an average visitor travelled at about fifty miles per hour, considering the fact that most visitors were out-of-state visitors and thus were assumed to have travelled on major routes to Newport. Visitation rates were calculated by dividing the number of visitor-days from a county or zone to the NISS 1982 by that county's or zone's population obtained from the Rand McNally's Commercial Atlas and Marketing Guide of 1986.

"Representative" Boat Race Event - BIRW 1986:

$$TC_{ij} = (\text{Distance} * \text{two} * V_T) + P$$

where

TC_{ij} = Travel costs from zone i to event site j .

Distance = Travel time (in hours) from i to j in 30 minute units.

Two = Round trip factor.

P = Average total expenditure

V_T = Opportunity cost of travel time; assumed as one-third of average hourly wage rate for each zone.

The data for average total expenditure include expenditures incurred by boaters for marina and docking, cleaning, repair and equipment services, lodging, meals, entertainment and miscellaneous items. Because the Block Island Race Week is a sailing event, it was assumed that the other costs of operating the sailboat did not vary with distance to Block Island. Round trip distance was measured in nautical miles.

Other Explanatory Variables: In addition to the price variable which accounts for movements along a demand function, the "demand shifters" need to be accounted for when specifying the model. One of such explanatory variables considered in this section is the visitor's personal income. The income variable used in this study is the zone's household per capita income. Household per capita incomes for all the zones were obtained from the 1986 Rand McNally Commercial & Marketing Guide.

Consumers' tastes and preferences are difficult to measure. Socioeconomic characteristics such as age, sex, place of residence would all seem to have important

influences on the type of event and number of days spent at event site. However, because of data suitability this study uses only data on percentage of the counties' populations that completed a certain number of years of education, provided by the 1983 U.S. Census Bureau City and County Data Book.

The influence of substitutes or complements is assumed to be a constant since these short-term events are unique events. Also, evidence shows that the planners of these types of events schedule them at specific dates so as to avoid any conflicts with similar events held within the region.

Population size, for any given area, is one of the important variables associated with demand for recreation. However, population normalizes the dependent variable of the demand function in the travel cost model used rather than entering the model as an exogenous or independent variable.

C.2 The Model and Results for the NISS 1982 Event:

$\text{Log}(P_i/1-P_i) = B_0 + B_1\text{Travelcost} + B_2\text{Income} + B_3\text{Education}$
where

P_i = proportion of visitor-days per capita.

$1-P_i$ = proportion of non-visitor-days per capita.

Table C.1 presents the coefficients and associated statistics for the general public that visited the Newport International Sailboat Show of 1982.

TABLE C.1 Estimated Demand for General Public at
NISS 1982

Dependent Variable: $\text{Log}(P_i/1-P_i)$

VARIABLE	PARAMETER ESTIMATE	T-STATISTICS
Intercept	-8.021	-12.199*
Travelcost	-0.023	- 3.297*
Income	-0.00005	- 2.096*
Education	0.026	4.045*

R-square = 0.28 N = 99
F value = 12.535

* indicates level of significance at 95 percent.

The coefficients of travel cost and education are of the expected sign, and significant at ninety-five percent probability level. The coefficient of the income is expected to be positive, but it turned out to be negative and significant. The wrong sign could be attributed to the income measure used. It is not dropped from the estimated demand equation because it is considered important, given the underlying theory, and an omission might bias the estimates.

Table C.2 presents the estimated demand results for tourists. Here, the signs of the coefficient of travel-cost and education are also as expected. However, education is not significant. Again, the coefficient of income has a counter intuitive sign and remained insignificant.

TABLE C.2 Estimated Demand for Tourists at NISS 1982

Dependent variable: $\text{Log}(P_i/1-P_i)$

VARIABLE	PARAMETER ESTIMATE	T-STATISTICS
Intercept	-6.87	-6.92*
Travelcost	-0.042	-4.83*
Income	-0.00004	-1.10
Education	0.007	0.728

R-square = 0.35 N = 60
F-value = 10.308

*indicates level of significance at 95 percent.

In Table C.3, the results of the estimated demand function for Rhode Island resident visitors are presented. The sign of the coefficient on travel cost is consistent with a priori theory and its t statistic is significant. The coefficients of income and education are both of the expected sign but they are not significant.

TABLE C.3 Estimated Demand for Rhode Island Residents
NISS 1982

Dependent variable: $\text{Log}(P_i/1-P_i)$

VARIABLE	PARAMETER ESTIMATE	T-STATISTICS
Intercept	0.546	0.131
Travelcost	-0.423	-2.53*
Income	0.0002	2.06*
Education	0.003	0.338

R-square = 0.40 N = 29
F-value = 8.043

*indicates level of significance at 95 percent.

C.3 Model and Results for the Block Island Race Week 1986 Event

$$\text{Log}(P_i/1-P_i) = B_0 + B_1 \text{Travcost} + B_2 \text{Income} + B_3 \text{Education}$$

where P_i = visitor-days/number of slips and moorings for coastal and saltwater counties or zones only

Ideally, the total number of sailboats in each zone could have been an appropriate figure adopted in the calculation of P_i . Unfortunately, that information was not available. The number of slips and moorings was used to approximate sailboats in each zone. These figures were provided by the Marina Institute at Middletown and by Adjunct Professor Rorholm (personal communication). Table C.4 presents the estimated coefficients and associated statistics for the entire market demand. We were unable to estimate separate demand functions for tourists and R.I. residents because of limited data.

Table C.4. Estimated Demand Function for BIRW 1986

Dependent Variable: $\text{Log}(P_i/1-P_i)$

<u>Variable</u>	<u>Parameter Estimate</u>	<u>T-Statistics</u>
Intercept	-2.4044	-2.109
Travelcost	-0.0055	-1.95*
Income	0.0002	3.23*
Education	-0.015	-0.905

R-Square = 0.25 N = 40
F-Value = 3.895

*indicates level of significance at 90 percent.

The coefficients of travel cost and per capita income were of the expected sign and both were significant at ninety percent probability level. The education coefficient was negative and insignificant.

The demand for boating is almost perfectly elastic with respect to price. However, this does not mean that visitor-days could be infinite. The sponsors of such boating events limit the number of boats allowed and also the number of days of the competition. For example, the BIRW (1986) had to turn down many entries once they got the "required" number of boats registered for the race. Another way that sponsors limit the number of boats and boating days is by specifying the categories of boats that could participate in such events. This is accomplished by specifying the allowable "ratings" of participatable boats.

The travel cost elasticity of demand was calculated for BIRW 1986 and the NISS 1982. It revealed that a one percent increase in travel cost would decrease the proportion of demand by 10.82 percent for the boaters of BIRW 1986. In contrast, a similar increase in travel costs would reduce residents at NISS by 7.17 percent and tourists at NISS by 2.04 percent. A comparison of NISS tourists and R.I. residents and Block Island Race Week boaters shows the following relationships:

$$\left| \begin{array}{c} \text{Price} \\ \text{Elasticity} \\ \text{For All} \\ \text{Boaters At} \\ \text{BIRW} \end{array} \right| > \left| \begin{array}{c} \text{Price} \\ \text{Elasticity} \\ \text{For All} \\ \text{Residents At} \\ \text{NISS} \end{array} \right| > \left| \begin{array}{c} \text{Price} \\ \text{Elastiticy} \\ \text{For All} \\ \text{Tourists At} \\ \text{NISS} \end{array} \right|$$

APPENDIX D

THE FISHBEIN'S ATTITUDE MODEL

The Fishbein's model theorizes that a person's behavior is a function of his intentions to behave in a certain manner and other intervening factors. This means that intention to behave cannot be expected to be a perfect predictor of behavior. Two factors are seen to influence a person's intentions to visit an event:

- a) his attitude toward participation in that event;
and
- b) "subjective norms" which are the individual's perceptions of how others who are important to him will react to his behavior.

That is:

$$B \quad BI = w_1(AB) + w_2(SN)$$

where B = the person's actual behavior, which is approximately equal to BI

BI = his intention to behave in a specific manner

AB = his attitude toward participation

SN = subjective norm regarding person's actual behavior

w_1 and w_2 = weights representing the relative importance of AB and SN , respectively, on the behavioral intention.

The relative influence of each of these factors will determine the exact nature of the person's behavioral intentions. Figure D.1 illustrates the path of a person's

behavior. The figure shows that attitude about the event is determined by the consumer's attitude toward the event and the expected consequences from such behavior and how important those consequences are to him. That is:

$$AB = \sum_{i=1}^n b_i e_i$$

where A_B remains as defined above,

b_i = the person's belief that participating would result in consequence i ,

e_i = refers to how important the participant views consequence i , and

n = number of relevant behavioral beliefs.

As is, relevant beliefs must be determined and then these beliefs and their degree of importance must be measured on scales. A hypothetical illustration is given in Table D.1 for two tourism events: the NISS and WBS held at Newport.

Additional relevant beliefs may include location and event attributes. The overall attitude of this hypothetical visitor is

$$AB = \sum_{i=1}^n b_i e_i = 21 \text{ for NISS and } 14 \text{ for WBS,}$$

and since the perception index for an average event is 1.0, then NISS = 2.1 while WBS is 1.4. This means that consumers perception for the NISS is greater than the perception for WBS.

Figure D.1 Relationship of components in Fishbein's Behavioral Intentions Attitude Model

Source: Adapted from D.L. London and A.J. Della Bitta, 1984, "Consumer Behavior: Concepts and Applications."

Table D.1. Example of Calculating Overall Attitude on Participation

Relevant Beliefs About Consequences	Beliefs (b_i)	Strengths Score (e_i)	Importance ($b_i e_i$)	Product	
	NISS	WBS		NISS	WBS
Buy a boat	2	3	2	4	6
Socialize	3	1	2	6	2
"Be Expensive"	1	0	-1	-1	0
Vacation	4	2	3	12	6
Total =				21	14

Also, subjective norms about one's behavior toward an event are influenced by the consumer's beliefs or thoughts on how other persons perceive him acting toward the event on the one hand, and individual's motivations to comply on the other hand. That is

$$SN = \sum_{j=1}^k b_j m_j$$

where SN remains as defined above,

b_i = consumer's beliefs that person X thinks he should attend the event or nor,

m_i = individual's motivations to comply with the thoughts of person X, and

k = number of relevant referents.

In order to determine the consumer's subjective norms for participating in an event, we need to identify the individuals or group who have the most influence on the consumer's behavior. These are called salient referents in the marketing literature. Often this information can be obtained through a questioning process. Using the NISS

and WBS example again, Table D.2 illustrates hypothetically how this could be accomplished. Questions such as

- 1) Does anyone think you should attend or not?, and
- 2) How much do you want to do what Mr. X thinks you should do?

The answers to questions 1) and 2) measurable in scales would yield values for b_i and m_i , respectively. Suggested scales are presented at the end of Table D.2.

Now assume there are three salient referents, X, Y, and Z with different scaling factors for consumer P, as shown in Table D.2. Overall, we observe that the subjective norm favors the participation in WBS (1.3) more than the NISS (0.4).

The last step needed to determine consumer's behavioral intentions is the determination of weights that reflect the relative importance of individual attitude and subjective norm towards participation. These weights should be generated from regression analysis of a preliminary study used in deriving A_p and SN separately.

Table D.2. Example of Calculating Subjective Norms on Participation

Salient Referents	Answers to Question 1		Answers to Question 2	Product ($b_i m_i$)	
	<u>NISS</u>	<u>WBS</u>		<u>NISS</u>	<u>WBS</u>
Mr. X	-1	2	3	-3	6
Mr. Y	3	1	1	3	1
Prof. Z	2	3	2	<u>4</u>	<u>6</u>
				4	13

$$SN = \sum_{i=1}^k b_i m_i$$

<u>Scale</u>	<u>Question 1</u>	<u>Question 2</u>
3	Strongly agree	Very strongly
2	Moderately agree	Strongly
1	Agree	Moderately
0	Indifferent	Indifferent
-1	Do not	Refused
-2	Moderately do not	Moderately refused
-3	Never	Strongly refused

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