

# **The Impact of the Tourism Sector on the Vermont Economy: The Input-Output Analysis**

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## INTRODUCTION

Vermont has become one of the most travel-expenditure-dependent economies in the United States. Vermont has the advantage of possessing a spectacular landscape, a clean environment, and an attractive agriculturally based rural community, all of which provides an excellent opportunity for tourism industry development. Vermont also benefits from tourists' activities for the income, jobs, tax revenue and business opportunities brought in by tourists. In 1992 in-state and out-of-state travelers spent an estimated \$1.84 billion, accounting directly and indirectly for 40,500 jobs (Waters, 1996). That means the tourists' expenditure per capita is about \$3,270, ranking Vermont eighth of the fifty states. Tourists' expenditure accounts for 15% of the Gross State Product (GSP), ranking Vermont sixth of the fifty states.

Understanding the economic importance of the tourism sector and the strength of its links to other sectors is important. However, reliable facts on the economic impacts of the tourism industry are not readily available because of several reasons, including no separate SIC code for tourism sector, limited historical tourism data in Vermont etc.

The objective of this study is to evaluate the economic impacts of Vermont tourists' expenditure using an input-output model. The specific objectives of this study are:

1. To construct a tourism sector in the Vermont input-output model. This will entail collecting primary data for the tourism industry in Vermont.
2. To estimate the economic impacts of U.S. tourism spending on Vermont's economy by analyzing the tourism's effect on the gross state product, employment, tax generation and the strength of inter-industry linkages.
3. To estimate the economic impact of lodging businesses by size on the Vermont economy.
4. To evaluate the economic impact of ski areas in Vermont on the Vermont economy.

## Input-Output Model

Input-Output (I/O) analysis is one of the most widely used method to evaluate the economic impact of tourism on an economy (Schaffer 1985, Curry 1986, Liu and Var 1982, Liu 1986, Seow 1981, Heng and Low 1990, Bergstrom, Cordell, Ashley and Watson 1990, Dawson, Blahna, and Keith 1993, Douglas and Harpman 1995, Archer 1996, Longwoods International 1990,1991,1992,1993,1994). An I/O model traces the flow of goods and services, income, and employment among related sectors of the economy. This study used the IMPLAN software, which was developed by U.S. Forest Services.

The transaction matrix for IMPLAN includes 528 sectors, of which 344 sectors exist in Vermont. In this study, the Vermont model is aggregated into 112 sectors to simplify the calculation of the economic impact of tourist expenditures. To estimate the economic impact of tourist expenditures, we separated tourists expenditures from non-tourists expenditures in eating and drinking sector (SIC 58), hotel and lodging sector (SIC 79), amusements and recreation services (SIC 79), some of retail sectors (SIC53, 54, 59), some transportation sectors (SIC 41, 42, 44, 49 etc) and some services sectors. Then we aggregated all the tourist expenditures into a tourism sector to calculate its economic multipliers.

The IMPLAN model estimates the *direct effects*, *indirect effects*, and *induced effects* of an economic activity. *Direct Effect* refers to production change associated with a change in demand for the good itself. It is the initial impact to the economy. *Indirect Effect* refers to the secondary impact caused by changing input needs of directly affected industries (e.g., additional input purchases to produce additional output). *Induced Effect* is caused by changes in household spending due to the additional employment generated by direct and indirect effects.

The IMPLAN model also estimates economic multipliers such as *output multiplier*, a *personal income multiplier*, an *employment multiplier*, and *indirect business tax multiplier*. An output multiplier for a sector is defined as the total production in all sectors of the economy that is necessary to satisfy a dollar's worth of final demand for that sector's output (Miller and Blair, 1985). Employment multipliers mean that

for every million-dollar change in direct output in a certain sector, the change in number of jobs in the economy.

## **Data Sources**

This study uses data from three sources.

### Visitor Survey

First, the University of Vermont (UVM) developed a Vermont visitor survey to collect tourist expenditure and trip data. To administer the survey, UVM derived a sample population from a national group of 225,000 households, compiled by a national consulting firm (NPD Group). The survey includes a question to separate Vermont tourists from the sample, which reads “ If you took a trip to or through Vermont anytime in the past year, please ‘x’ the season(s) in which you visited.” Of the 225,000 households, 152,652 households responded to the question at a response rate of 68%. Subsequently, a geodemographically balanced Vermont visitor sample of 6,800 was created from the national group. Then we took a random sample of 2,940 Vermont visitors from the 6,800 households and sent them a detailed follow-up questionnaire asking about their trips to Vermont such as length, purpose, expenditure and party size etc. 1,753 questionnaires were returned at a response rate of 60%.

### Business Survey

Second, the study requires a survey of expenditures within tourism related businesses in the state. The business survey concentrates on the lodging industry and the ski industry for the first year of study, as these two industries are perceived as important to Vermont tourism. The purpose of lodging and ski area surveys was to establish the industry profiles and find out the total revenue and cost structure of the lodging businesses and ski areas in Vermont. The cost structure data collected were used to create the input-output coefficients for the lodging sector and the ski area sector. The lodging survey was sent to the entire

population of 1,027 lodging businesses in Vermont in August 1998. 302 lodging businesses responded with a respond rate of 29%. Among the questions asked were type and size of lodging business, occupancy rate by month, employment number, total revenue, expenditures by categories, local purchase percentages, guest type, and tourist origin etc. The ski area survey was sent to all members of state ski area association (14 ski areas) with questions similar to the lodging surveys. Ten ski areas responded with a response rate of 71%.

### IMPLAN

Finally, the Vermont input-output model uses data on Vermont's economy for the year 1995, the most recent year for which data are available. The Minnesota IMPLAN Group supplied the base data on a county level. Minnesota IMPLAN Group assembles its data from a number of sources, including the U.S. Bureau of Labor Statistics, the U.S. Bureau of Economic Analysis, USDA, and the U.S. Census of Agriculture (Minnesota IMPLAN Group).

## **ANALYSIS AND RESULTS**

### Economic Impact of U.S. Tourists' Expenditures in Vermont

In 1997, 4.62 million U.S. tourists (1.92 million households) took an estimated 6.61 million trips to Vermont with an average party size of 2.38 persons, equivalent to 15.74 million person-trips. On average each visiting household took 3.41 trips to Vermont.

These visiting households stayed an average of 3.52 nights on each of their visits. Among Vermont visitors, 79% stayed overnight, while 21% said they took day-trips or were passing through the state on their way to another destination. The average size of each visiting group was 2.38, with an average of 0.45 children in each group.

Thirty percent of the trips to Vermont were made in the summer; 26% in the winter and 26% in fall; and 18% were made in the spring. Winter visitors tend to spend more money for each trip, or that winter

trips are more costly. Most tourists' reasons for visiting Vermont is to visit friends and relatives (26%), followed by shopping (14%), skiing (11%) and viewing fall foliage (8%). Households in New England and the Mid-Atlantic States (i.e. New York, New Jersey and Pennsylvania) made up 56% of visiting households to Vermont.

U.S. tourists spent a total of \$2.2 billion in Vermont in 1997. Expenditure categories are dominated by lodging (27%) and restaurant (21%) expenditures. Together these account for nearly half (48%) of all U.S. tourists' expenditures in Vermont. However, retail purchases and recreation expenditures also have a significant impact, accounting for 17% and 15%, respectively.

Table 1 shows the impact of the tourism sector on output, employment, personal income, and indirect business taxes. In 1997, U.S. tourist spending contributed to \$3.7 billion, or 15% of state output in total. Of that amount, \$ 2.2 billion was the direct impact and \$1.5 billion indirect and induced impacts. Tourist expenditures contributed to 80,047 jobs in total, which are about 22% of total jobs in the state. Of that 80,047 jobs, 70% (55,740 jobs) were attributed directly to tourist expenditures and 30% (24,308 jobs) were created due to the indirect and induced impacts of tourist expenditures. These jobs include both full-time jobs and part-time jobs. Tourism also generates \$1.4 billion in personal income (employee compensation and proprietary income) and \$267 million in indirect business taxes for the state, which are 14% and 24% of total state personal income and indirect business taxes, respectively.

**Table 1 Tourism Economic Impact on Output, Employment, Personal Income and Indirect Business Taxes for 1997**

	Direct	Indirect	Induced	Total	% of State
Output (million \$)	2,210	626	909	3,745	15
Employment (jobs)	59,878	9,104	15,081	84,063	23
Personal Income (million \$)	850	204	335	1,389	14
Indirect Business Taxes (million \$)	183	30	54	267	24

For the tourism sector, the output multiplier is 1.69. We also estimated a personal income multiplier of 0.55; an employment multiplier of 38; and an indirect business tax multiplier of 0.12. The tourism

output multiplier (1.69) is about average (1.71) when compared to other sectors in the state. Total tourism employment multiplier (38) is relatively high among the sectors (state average of 32), meaning that relatively more jobs are created for every million dollar brought in by the tourism sector. Our study also shows, however, that a large proportion of these jobs created is in the tourism sector itself. The indirect business tax multiplier for tourism is much higher than the state average. For every dollar tourists spend in Vermont, indirect business taxes will increase 12 cents, as compared to the state average of 7 cents. As such, the tourism sector has a higher than average ability to generate indirect business taxes for the state.

### Impacts of Lodging Businesses on the Vermont Economy

In 1997, Vermont had 1,027 lodging businesses with a total of 26,098 rooms/units (Vermont Tourism Data Center, 1998). Vermont lodging businesses are mostly small in size. Over half (51%) have ten or fewer rooms/units. Over 70% have fewer than twenty rooms/units.

The study breaks down lodging businesses by three sizes: small size ranges from 1 to 9 rooms; medium size ranges from 10 to 49 rooms; and large has more than 50 rooms. The average revenue ranged from \$45,237 for a small lodging business to \$3.6 million for a large lodging business. A medium-size lodging business on average receives revenue of about \$334,000. The state's total lodging sales are estimated to be \$667 million in 1997, according to our survey.

The lodging survey reveals that different sized lodging businesses have different cost structures, local purchase patterns, profitability levels and occupancy rates. For example, the data shows clearly the larger lodging businesses, the higher the occupancy rates. The average annual occupancy rates for large, medium, and small lodging businesses are 54%, 42%, and 30% respectively. Moreover, medium-size lodging businesses earned the highest percentage of profit (20%), followed by large and small businesses. The larger the lodging business, the higher the percentage of their total costs that went to wages. Data also reveals that small lodging businesses purchase a higher percentage from the Vermont market.

Lodging businesses also vary significantly in terms of multiplier effects. Large lodging businesses, although fewer than any other size of lodging businesses (133 out of 1027 businesses), account for 76% of the lodging sector sales. However, small and medium lodging businesses have higher output multipliers. Specifically, the output multipliers for small, medium and large lodging businesses are 2.48, 2.47 and 1.90 respectively. The multiplier is relatively smaller for large lodging businesses mainly because large businesses purchase a higher percentage of goods and services from out of the state. As to the employment multiplier, small businesses have a higher multiplier. For every million dollars of sales of small, medium and large lodging businesses, jobs will be created in the state as follows: 82 jobs by small lodging businesses; 51 jobs by medium-size lodging businesses; and 46 jobs by large lodging businesses. Small lodging businesses seem to have a higher ability to generate jobs, but most of the jobs generated are in lodging sector itself (about 62 out of 82 jobs).

Small lodging businesses show some features that are noteworthy when compared to larger businesses, such as their ability to generate more local spending, employment and indirect business tax income. However, their profits seem to be low. The lower profits could be partially attributed to their much lower occupancy rates in addition to their higher tax burden. Medium-sized lodging businesses, according to data, show a better financial picture. They generate a higher profitability and have a greater ability to generate income for the state. Larger lodging businesses have the highest sales and historically accommodate most of the visitors. However, the relatively weaker inter-industry linkages lower their impact of large lodging businesses to the rest of the economy.

### Economic Impact of Vermont Ski Areas

Skiing is one of the most important recreation activities in Vermont.. In 1997, there were 21 ski areas in Vermont. The Vermont Department of Employment and Training reported 4.2 million skier days<sup>1</sup>

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<sup>1</sup> 1 skier day = 1 person skiing for 1 whole day, 1 season pass accounts for approximately 25 skier days



in the year 1997-1998. In 1997, Vermonters were the largest patrons of Vermont ski areas (21%), followed by residents of New York (19%), Massachusetts (17%), New Jersey (13%) and Connecticut (12%)

On average, each ski resort makes \$19 million in the winter season (from November to the following April) and \$4.3 million in the summer/fall season (May to November). On average, each Vermont ski area employs 881 people, with 130 full-time year-round employees. Not including benefits, a full-time year-round employee's average salary is \$29,171 per year. The average hourly wage for part-time and seasonal employees is \$7.68 per hour. As to the cost structure, the biggest component for ski area expenditure is employee compensation (24.4%), followed by cost of goods sold (17.2%), capital expenditure and improvement (i.e., investment on durable goods) (14%), depreciation (6.6%), and taxes (5.9%).

Based on the revenue and cost data, the economic impact of ski resorts is estimated for all the business activities operated by ski resorts, including recreation facilities; condo rentals, restaurants, real estate sales, retail stores and other services such as golf courses and property services.

The ski area output multiplier of 1.94 is higher than that of the tourism sector (1.69). In terms of the employment multiplier, for ski areas every million dollar sales generates 44.8 jobs in total, much higher than the tourism sector figure of 38 jobs.

## **DISCUSSION AND SUMMARIES**

This study quantifies the economic activities of tourism-related sectors in Vermont and estimates its economic impacts through the development of a tourism sector. Analysis shows tourism is a very important sector to Vermont economy. In 1997, 4.62 million tourists made 15.74 million person trips to Vermont and spent \$2.2 billion. The tourism industry accounts for 15% of the total state output value, 23% of the state employment, and 24% of the indirect business tax. So tourism sector is a very important sector in Vermont economy. For every million dollars spent by tourists in Vermont, 38 jobs are created, an additional \$690,000 worth of output will be generated, personal income will increase by \$545,363, and indirect

business taxes will increase by \$120,754. Compared to other sectors in the state, tourism has a high ability to generate employment and indirect business taxes for the state.

Moreover, this study develops a profile for Vermont lodging businesses and ski areas and estimates their economic impact. Large lodging businesses account for most of the lodging sector sales, but their multiplier effect is smaller. This is mainly because the large lodging businesses buy a higher percentage of their inputs from out-of-state. Medium-size lodging businesses have output multipliers close to those of small lodging businesses and they have the highest personal income multiplier. Small-size lodging businesses show the highest employment multiplier and indirect business tax multiplier, but their profitability level is low. Stronger multipliers of small and medium lodging business are resulted from their strong inter-industry linkages with other sectors in Vermont economy. These results imply some potential development directions. For example, if large lodging businesses are given more incentives to buy from local market, it will result in stronger inter-industry linkages, thus higher multipliers for large lodging businesses. Another example is, if small lodging businesses can increase their currently low occupancy rate, their profitability will be increased, and so will be their market shares of total sales. Increasing their share of total sales of the whole lodging sector will result in a healthier lodging sector because of the high multipliers of the small lodging businesses. However, two points need to be made. First, input-output model does not look at the cost-benefit aspects of development investment. It does not compare the cost-effectiveness of different development strategies. In other words, to increase every dollar sales in small versus large lodging businesses might require different efforts and costs. Second, input-output model does not look at the demand side. In other words, different demand situations such as consumer preference and price elasticity are not taken into account when we compare the economic impact of varying sized lodging businesses. In addition, generally ski areas, like lodging businesses, have higher multipliers than tourism sector as a whole. From tourism development perspective, if incentives are provided for tourist to spend a

higher percentage of their expenditures on lodging and skiing, tourists' expenditures will have higher multipliers to the state economy.

## References

1998 Official State of VT General Obligation Refunding Bonds

- Archer, B. and Fletcher, J. (1996). "The economic impact of tourism in the Seychelles". *Annals of Tourism Research*. 23(1):32-47.
- Bergstrom, J. C., Cordell, H. K., Ashley, G. A. & Watson, A. E. (1990). "Economic Impacts of Recreational Spending on Rural Areas: A Case Study". *Economic Development Quarterly*, 4(1): 29-39
- Curry, Steve. (1986). "The Economic Impact of the Tourist Industry in the United Republic of Tanzania: an Input-Output Analysis" *Industry and Development* v0 n19 1986, pp. 55-75
- Dawson, S., Blahna, D. and Keith, J. (1993). "Expected and Actual Regional Economic Impacts of Great Basin National Park". *Journal of Park and Recreation Administration*, 11(1): 45-57
- Douglas, A. J. & Harpman, D. A. (1995). "Estimating Recreation Employment Effects with IMPLAN for the Glen Canyon Dam Region". *Journal of Environmental Management*, 44: 233-247
- Heng, T. M. and Low, L. (1990). "Economic Impact of Tourism in Singapore". *Annals of Tourism Research*, 17, 246-69
- Institute for Tourism and Recreation Research (1995) "Nonresident travel to Montana".  
<http://www.forestry.umt.edu/itrr/sub/IMPACT.HTM>.
- Johnson, Rebecca L., Obrermiller, Fred, and Radtke, Hans(1989) "The Economic Impact of Tourism Sales". *Journal of Leisure Research* Vol 21, No2 pp 140-154
- Liu, J (1986). "Relative Economic Contribution of Visitor Groups in Hawaii". *Journal of Travel Research*, 15, 2-13.
- Liu, J. and Var, T. (1982). "Differential Multipliers for the Accommodation Sector". *Tourism Management*, 3, 117-87.
- Longwoods International and Center for Survey and Marketing Research studies. including:  
*The Economic Impact, Performance and Profile of the Vermont Travel and Tourism Industry 1993-1994*. Vermont Agency of Transportation, 1995.  
*The Economic Impact, Performance and profile of The New Jersey Travel and Tourism Industry 1990-1991*. New Jersey Department of Commerce and Economic Department, 1992).  
*The Economic Impact, Performance and profile of The New Jersey Travel and Tourism Industry 1991-1992*. New Jersey Department of Commerce and Economic Department, 1993.  
*The Economic Impact of The Connecticut Travel and Tourism Industry 1992-1993* Connecticut Department of Economic Development, 1995.
- Minnesota IMPLAN Group, Inc. (1996). *IMPLAN Pro Beta User's Guide*.

- Miller, Ronald E., and Peter D. Blair. (1985). *Input-Output Analysis: Foundations and Extensions*. New Jersey: Prentice-Hall.
- Schaffer, Ron. (1979). "Estimating Local Income Multipliers: A Review and Evaluation of the Techniques for Ex Ante Use." In: Proceedings of the Ex Ante Growth Impact Models Conference. March 6 and 7, 1979, Columbus, OH.
- Seow, G. (1981). "Economic Impact Significance of Tourism in Singapore", *Singapore Economic Review*, 26, 64-79
- U.S. Travel Data Center. (1996). *Impact of Travel on State Economies*. 1996.
- Vermont Department Of Employment and Training publications. Including:  
*Economic and Travel Indicators*. 1997-1998.  
*State of Vermont 1997 Employment and Wages*. 1998.  
*Vermont Occupational Employment & Wage Survey 1996*. 1997.  
 DET web site : <http://www.det.state.vt.us/>
- Wagner, John E. (1997). "Estimating the Economic Impacts of Tourism". *Annals of Tourism Research*, Vol. 24, No.3, pp.592-608, 1997.
- Waters, Somerset R. (1996). *Travel Industry World Yearbook: The Big Picture 1995-1996*
- Zhou, Deying, Yanagida, John F., Chakravorty, Ujjayant, Leung, PingSun. (1997). "Estimating Economic Impacts From Tourism". *Annals of Tourism Research*, Vol. 24, No.1, pp. 76-89, 1997.