ASSESSING THE IMPACTS OF TRAVEL AND TOURISM – MEASURING ECONOMIC BENEFITS

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Eight approaches to estimating travel expenditures in an area are explained and evaluated. Sample surveys and respondent recall bias are discussed in detail. Simulation models of economic impact are presented, with the Travel Economic Impact Model evaluated by the criteria established in Chapter (preceding). Measuring secondary benefits is also discussed, including alternative techniques for estimating multipliers.

The economic benefits of travel and tourism in an area are the gross contributions to resident income and wealth resulting from the presence of travelers. Normally, this income will result from traveler expenditures in the area. One could conceive of increased resident wealth in the absence of any visitors, say through construction of a tourist facility by a nonresident in anticipation of visitors who never arrive, but this is an unlikely exception that tests the rule.

Resident individuals' wealth may be augmented through labor earnings, rising real property values, or returns on capital invested in tourist facilities. Corporations are residents, too, and their wealth increases with profits and rising asset values. As a practical matter, economic benefit studies have focused on labor income and generally ignored the other measures. This is primarily due to the difficulty of estimating increases in real property values from tourists (indeed, values may *decline* with rising visitor volume), corporate profits of tourism facilities, and returns on tourism capital investment. Moreover, these wealth increases often accrue to non-residents of the area as absentee owners.

There is an implicit consensus in economic benefit studies that we wish to determine the benefits accruing to residents. These are the people needing employment if tourism is viewed as an economic stimulant, and they are the people who choose the area's political leaders and representatives. While tourism development projects sometimes end up benefiting absentee owners more than residents, it is unlikely the residents and local government originally had this objective in mind.

Measures of the direct benefits of travel spending in an area normally comprise business receipts or gross sales of establishments in the area visited, personal income (usually limited to forms of compensation paid to employees, such as wages, salaries, commissions, bonuses,

vacation allowances, tips, etc.), employment in terms of total jobs or full-time equivalent jobs, and, national, state and local tax revenue (*e.g.,* Travel Data Center 1991a).

The following pages discuss difficulties and methods of estimating the direct economic benefits of tourism in an area, and evaluation by the criteria established in Chapter 31. Methods of quantifying secondary benefits are introduced and evaluated as well.

No single chapter can exhaustively discuss measuring the economic benefits of travel and tourism. Indeed, at least one *book* has been devoted to estimating the impact of a single facility (*e.g.,* Johnson and Thomas 1991). It is hoped that the reader will explore the individual references listed at the end of this chapter for further treatment of the issues.

TRAVEL EXPENDITURE ESTIMATION METHODS

Tourism's economic impact on an area is a flow process. We can take snapshots of the flow over any time period we choose and call the resulting estimates the economic impact of tourism. The objects in our snapshot will usually include measures of benefits: traveler expenditures, business receipts, labor earnings, jobs, and government revenue. Sometimes, changes in real property and other asset values, and fixed capital investment will be included. Far less often, the picture will include some measure of costs. (see following chapter)

The presence of the traveler in the area, or his advance reservations and payments, begins the impact process. Most studies of economic benefits begin with the traveler's expenditures. Estimating the expenditures of individuals while traveling away from home is a formidable task, and judging from the extensive literature on travel impact estimation, there is no consensus on the best at this time. There are at least eight major approaches to estimating tourism expenditures in a geographic area recognized in the literature on the subject:

1. Direct observation
2. Sample surveys
3. Bank returns
4. Residual receipts models
5. Seasonal difference models
6. Supply side judgmental models
7. Expenditure ratio models
8. Cost factor models

Each of these approaches are discussed in turn below, and then each will be evaluated by the established criteria.

DIRECT OBSERVATION

The simplest way to obtain estimates of traveler expenditures would appear to be to actually observe the traveler purchasing food, gasoline, lodging, and other items, either by following him around or asking the seller to record purchases by local versus non-local customers. It would, of course, be quite expensive to follow the traveler even if he would allow

this. Moreover, this method could distort travel spending patterns that would occur in the absence of an observer.

The sellers of air, bus, rail and cruise transportation can estimate sales to travelers with a high degree of reliability due to the nature of their business. However, it is unlikely that restaurateurs, gas station operators, or entertainment and recreation facility managers can do so. Even hotel and motel operators do not have an easy time making such estimates. In a study conducted by the State of California in the San Diego area, hotel/motel operators were asked to estimate the percentage of their business arising from tourism. The responses ranged from forty percent to one hundred percent (Division of Tourism 1974, p. 21). It seems fair to conclude that following the traveler is not feasible, and business operators do not know distribution of their receipts between visitors and local residents (West Virginia University 1981, p. 52).

Similarly, the *end-use* focus of travel impact studies prohibits valid application of the direct observation approach for measures of tourism impact other than expenditures and business receipts. If business operators cannot estimate accurately the proportion of their receipts due to tourists, we cannot expect employers or employees to correctly assess how many of jobs are attributable to tourism. And there is no direct way to determine travel-generated profits, tax revenue, or income, except in a few cases of industry sectors or individual business establishments where it can be documented that virtually all receipts are attributable to travelers or visitors.

This group is small relative to the universe of businesses and items affected by travel and tourism. It includes Amtrak (although some studies suggest a significant proportion of receipts are derived from daily commuters), air passenger service (when it can be separated from cargo and other non-passenger airline activities), commercial lodging guest room rentals (distinct from food-and-beverage service activity), intercity bus service (if passenger revenue can be separated from that of other services), cruise lines, and arrangers of passenger transportation (travel agents, tour operators, etc.). Information can be derived on travel's economic contributions from tax, business and employment data through the application of direct observation for these travel industry sectors.

However, we should not focus on a segment just because it is easy to measure. A far more comprehensive and accurate picture of travel's economic benefits must come from examination of all business types, goods, and services affected by travel demand.

SAMPLE SURVEYS

The most popular travel expenditure estimation method in the literature is to survey a probability sample of travelers, either while traveling or in their homes. The results from questions on expenditures can then be projected to produce estimates of business receipts in various types of businesses. Surveys of travelers can be conducted as they enter an area (entry surveys), as they leave the area (exit surveys), or while in the area under study (visitor surveys). In addition, *enroute* surveys can be conducted while passengers are traveling on an airplane, train, bus or ship.

Among these, entry surveys are the least satisfactory because they cannot obtain information on actual expenditures in the area, only amounts intended, or "budgeted," to be spent.

Recall Bias

Exit surveys are superior to visitor surveys if one assumes no decay in respondent ability to recall spending amounts as the time elapsed between expenditure and interview increases. The recall issue is the most crucial in travel-generated business receipt estimation, and has received substantial research attention. If there is little or no loss of recall as a function of the time lapse between purchase and interview, then it makes little difference when the interview is conducted. Travel expenditure estimates derived from household surveys conducted months after the trip are just as accurate as those done in transit. However, if recall declines significantly as the duration between purchase and interview increases, then the most accurate direct observation results are obtained by reducing the time lapsed to a minimum: interviewing travelers while traveling.

A number of researchers have found that respondents cannot recall expenditures accurately after the fact.[1] One reason is the myriad of items a traveler may purchase on his trip. Moreover, currency may not change hands when the purchase is made, as the traveler may pay by personal checks, traveler's checks, vouchers, or credit card. It is difficult to believe the traveler can remember each of the cash or non-cash purchases he makes, and the amount as well.

In addition to problems with the human memory, the traveler may never know what some of his expenses were. Many expenses of business travel, convention trips, and incentive travel are paid directly by an employee's firm. This type of travel spending produced the lowest response rates among the expenditure questions in the U.S. Census Bureau's 1977 National Travel Survey (Bureau of the Census 1979).

There is one last difficulty in obtaining reliable expenditure information from travelers. Package tours provide transportation, accommodations, meals, entertainment, or any combination of these for a single price. The traveler cannot usually tell how much of the tour price is attributable to items provided in a given locale. Consequently, he cannot give the interviewer reliable information on his expenditures in the area under study.

Some objective evidence on the scope of recall decay in obtaining travel spending estimates is available. In the 1977 National Travel Survey, respondents who took trips involving public transportation, commercial accommodations, or a package tour were asked to report their expenditures for each of the categories. The elapsed time between the trip and the interview was as long as three months. Among those who took package tours, the tabulated data suggest only 70 percent could respond with any cost estimate at all. For public transportation and lodging, the response rates were higher: 85 percent and 92 percent,

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[1] Church 1969; Lansing and Morgan 1971, pp. 123-126; Bureau of Management Consulting 1975a, p. 41; Haynes 1975; Ritchie 1975, pp. 3, 5; Mak, Moncur and Yonamine 1977; Meyberg and Brog 1981, p. 47; Steel 1981; Davidson quoted in Woodside 1990, p. 6; Stynes and Mahoney 1989; Burd 1991, p. 6.

respectively. These rates only indicate the proportion of those with eligible trips who reported some expenditures. They do not suggest the degree of under-reporting of expenditures that may have taken place (Bureau of the Census 1979, pp. 54, 59).

Tourism Canada has concluded that travel expenditure estimates from surveys "are of low quality, expensive, and untimely." (Chau 1988, p. 3) This matches the conclusion by the British Columbia Ministry of Trade, Development and Tourism that visitor surveys "cannot provide the necessary time-series economic data needed to determine the economic impact of the industry." (Burd 1991, p. 13).

In another case, comparison of visitor expenditure estimates in Hawaii derived from diaries kept by visitors and from questionnaires sent to former visitors one month after they returned home found "relative to the diary method, visitors who recall their vacation spending some time after returning home generally underestimate their expenditures" (Mak, Moncur and Yonamine 1977). The same conclusion was reached in a similar study in British Columbia (Burd 1991, p. 13). There, tourism expenditures reported by diary respondents were 30 percent higher than those who responded to a survey based on recall. The diary approach to traveler spending estimation has been applied elsewhere, but response rates in the 15-25 percent range raise serious concerns about respondent bias (Woodside 1981, Hunt and Cadez 1981, Burke and Gitelson 1990).

A study of delegates to a national conference found that post-trip recall of expenditures while attending were 20 percent less than estimates provided by respondents during the conference (Stynes and Mahoney 1989).

Howard, Lankford, and Havitz attempted to determine "how accurately travelers report trip expenditures" by gaining cooperation of participants in a track and field competition and their companions (Howard, *et al.*, 1991, p19). One member of each of 40 couples recorded expenditures during the competition, while the other was asked to estimate travel spending just before departure from the event. Comparing the mean daily expenditures reported by each indicated that reported trip expenses were eight percent lower than the recorded expenditures (*ibid.*, p. 21). However, subsequent analyses of the significance test indicated there was no significant difference in the expenditures reported by the two groups (Roehl 1992; Howard *et al.* 1992).

The Fish and Wildlife Service of the U.S. Department of the Interior sponsored an exhaustive study to determine whether one-year recall periods produced a "serious systematic bias" in survey estimates of hunting and fishing activities (Westat, Inc. 1989). The study compared recall of these activities and related expenditures over annual, six-month, one-month and two-week recall periods. The study found that recall bias increased with the length of the recall period. However, in contrast to other recall studies, here the longer recall periods resulted in *overreporting* of the number of hunting and fishing trips.

The researchers speculated telescoping (including trips that were not actually taken during the recall period), and prestige bias (respondent tendency to overestimate based on the social desirability or status of an activity) were contributing factors. In addition, counter to other recall bias studies, this survey's respondents were asked to summarize experiences rather than itemize each event (*ibid.*, p. 7-3). Results on expenditure estimation were mixed. Some

fishing expenditures were significantly higher with annual recall than with two-week recall, but there were no significant differences for hunting expenditures. (*ibid.*, 7-2). These estimates proved to be extremely variable, especially for hunting.

Other studies have also found that the length of the respondent recall period can bias estimates of real travel activity. For example, a comparison of the volumes of person-trips recorded in two different surveys of residents of the province of Ontario, Canada, found that the three-month recall method recorded only about forty percent the volume found in the one-month recall survey. (Rogers 1991, pp. 7-8) The same study found a mail survey of U.S. residents where the three-month recall volume of same-day or one-night trips was about 80 percent of the one-month recall level (*ibid.*, p. 9).

In a study of the impact of the amount of elapsed time between an intercity trip and the report of the trip on reported trip volume, Meyberg and Brog found that the longer the elapsed time, the smaller the proportion of actual trips reported. For example, more than four percent of actual intercity trips were unreported six to nine months later, and 13 percent were unreported nine to twelve months after they occurred (Meyberg and Brog, 1981, p. 48).

In 1992, Statistics Canada and Tourism Canada revised the biennial Canadian Travel survey to reduce the respondent recall period from three months to one month, anticipating "the suspected undercount of overnight trips should be significantly reduced." (Statistics Canada 1992) They noted this change should also diminish the undercount of same-day trips, "but not to the extent possible using an even shorter recall period."

More objective evidence is needed before handing down a final verdict on this important issue. However, the research that is available strongly supports the view that estimates of travel expenditures suffer as the elapsed time between purchase and interview increases. Moreover, for some types of travel, such as business, or package tours, the respondent may never have knowledge of his actual travel expenses in an area. In addition, recall of other trip events is also biased s the recall period increases.

Various methods have been tried to reduce recall bias in traveler surveys. During the years 1974-81, The Florida Division of Tourism conducted exit surveys including questions on out-of-state visitor expenditures during the previous twenty-four hours and was satisfied with the results (Haynes 1975; Schultz and Stronge 1980a). Subsequently, however, the question was changed to "a typical day," and then to requesting respondents' estimates of all expenditures in selected categories. (Pitegoff 1992)

Researchers in Utah and Idaho have asked travelers to complete diaries as they travel through their respective states, but low response rates cast doubt on the validity of the information collected (Harris, Tynon and McLaughlin 1990; Hunt and Cadez 1981).

This author believes recall decay substantially biases downward travel expenditure estimates derived from interviews more than a day or two after the purchase. Consequently, exit, visitor or enroute surveys where the expenditure recall period is limited to the previous 24 hours appear better choices than entry surveys (*eg.*, Murphy and Carmichael 1991).

<u>Other Estimation Issues</u>

Visitor surveys can also suffer from "length-of-stay" bias. If visitors are interviewed while they are in an area rather than when they enter or leave, the probability of being selected increases with the length of stay. A visitor staying ten days in Washington, D.C. has ten times the probability of being interviewed of one staying one day, *ceteris paribus*. This should be adjusted for in enroute surveys, or multiplying length of stay by daily travel expenditures is likely to produce estimates significantly biased upward (Archer and Sena 1975).

Like most sample surveys, traveler surveys require an estimate of the population size to which the sample results can be projected. If the survey is conducted among passengers on an airline, or visitors to an amusement park, this estimate is straightforward. However, if the population being sampled is defined as visitors to a geographic area without controlled access, then the population cannot be estimated with much confidence.

Researchers may encounter at least one other problem in estimating spending through traveler surveys. Sometimes the estimates are distorted by a few travelers who make unusually large purchases while in the area and bias the results of a small sample survey substantially upward. The motorist forced to buy a new set of tires while at his destination is one such case. A traveler who requires hospital care for an unexpected illness is another. This can be accounted for by asking both actual expenses during the previous 24-hour period, and which of these were atypical. However, it would be unwise to remove completely the atypical expenditures because they do indeed constitute traveler spending. Rather, samples over time can yield the correct probability of encountering these, and this is used to adjust the survey results for these expenses (Haynes 1975).

HOUSEHOLD SURVEYS

The conduct of surveys in the household have been discussed at length elsewhere (Lansing and Morgan 1971; Babbie 1973; Ferber 1978; Alreck and Settle 1985). The recall problem regarding travel expenditures as discussed earlier is a prime weakness of this approach. One strength is that sound sampling frames for household surveys are readily available and it is a simple matter to project sample results to the total population for absolute estimates, something traveler surveys do not readily permit.

There is an analog to the length of stay bias in household surveys. Those people who travel the most are by definition least likely to be home to be interviewed. Repeated call-backs and adjusting for probability of being at home can be used to reduce this potential source of bias.

Another drawback of the household survey is that it misses travelers in an area who do not belong to the population being sampled. For example, a survey using a probability sample of the U.S. population cannot provide information on foreign visitors in a locality. This requires either surveys among foreign resident populations, or surveys of travelers (*eg*., Travel and Tourism Administration, U.S. 1991).

Mail, Personal and Telephone Interviews

There are three basic modes of household surveys: mail, personal interview, and telephone interview.

Mail surveys are the least expensive, allow the largest sample size within a given budget, avoid not-at-home bias, eliminate interview bias, permit longer questionnaires, and allow respondents to consider their answers carefully, perhaps checking with other household members to insure accurate information (Bullin 1988). On the other hand, mail surveys are the slowest of the three modes, often adding four weeks or more to the survey process. Moreover, they permit the least control over question completion, are subject to loss in the postal system, do not permit interviewer probing for detailed recall, permit too much respondent self-selection, and produce the lowest response rates (Alreck and Settle 1985, pp. 43-46; Rappaport 1988). The last caused the U.S. Census Bureau to switch from mail to personal interviews in its last National Travel Survey (Bureau of the Census 1979, p. xxi).

Low response rates in mail surveys are likely to produce non-response bias, as those who take part in the activity being studied are more likely to respond than those who do not (Alreck and Settle 1985, pp. 45, 78; Murray 1991, p. 20). There is evidence that non-respondents to mail traveler surveys tend to be less mobile in terms of trip frequency than respondents (Hunt and Dalton 1983, Woodside and Ronkainen 1984). This bias cannot be easily removed by adjusting socio-demographic weighting procedures (Brog and Meyberg 1980). The U.S. Travel Data Center noted similar evidence in mail surveys conducted in 1974 through 1976 (Travel Data Center 1975, 1976, 1977). In sum, the low response rates found in mail surveys argue against using the results to generalize to any population (Turco and Kelsey 1992, p.p. 20-21).

Personal interviews have the virtues of shorter elapsed time between interview and processing relative to mail, and higher response rates either through repeated call-backs or by substituting similar households. The drawbacks of this mode are the high cost of interviewing, the difficulty of obtaining interviews in some areas due to crime or exclusivity, heavy training and field supervision requirements, and poor interviewer supervision (Alreck and Settle 1985, pp. 40-42). In some cases, interviewers have been known to falsify interview records to achieve interview quotas (Ferber 1978, p. 426).

Compared to personal interviews, telephone surveys are considerably less costly, produce results more quickly, provide for direct supervision of interviewers, and offer respondent anonymity that may improve response rates (Alreck and Settle 1985 *op. cit.*; Westat, Inc., 1989, pp. 4-10 to 4-12) Response rates are similar to home interviews, and can be higher through increased ease and lower cost of repeated call-backs.

Telephone surveys cannot be easily or accurately conducted among populations relatively inaccessible to the instrument. In the U.S., it is estimated that 97 percent of U.S. households have telephone service, making this an effective interview mode (Bureau of the Census 1981, p. 585). Another drawback is that telephone surveys do not permit lengthy interviews or questions with many choices or with exhibits.

Compared to mail surveys, telephone interviews are more costly. However, they are superior in minimizing lag between interview and processing, maximizing response rates, and providing control over the interview.

When considering an interview mode, it is important to determine whether the interviews will be conducted among a probability sample of the chosen population, or among a pre-selected *panel* of potential respondents.

Panel surveys are frequently found in the mail mode because they produce high response rates. These panels are large files of households that have agreed to be included in consumer surveys conducted by research firms (Alreck and Settle 1985, p. 46). When a survey is to be conducted, a sample of necessary size is drawn to reflect the characteristics, usually demographic, of the population as a whole. This approach generally produces significantly higher response rates than a "cold" probability sample.

The failure of this approach is due to the basically upscale nature of the pre-selected panel. People interested in participating in surveys are apt to be more active in many aspects of life than those who do not, regardless of income or level of education (Lansing and Morgan 1971, pp. 59-62). The U.S. Travel Data Center's 1974 and 1975 National Travel Surveys were conducted among mail panels and found a considerably higher incidence of travel among nearly all groups than the Census Bureau's probability sample (Travel Data Center 1975, 1976).

Moreover, since all households in the population do not have a known, non-zero chance of participating in the panel, techniques for estimating sampling variability cannot be applied. Confidence intervals at different numbers of standard deviations from the mean cannot be computed, so this guide to the reliability of the survey in reflecting actual population behavior is not available (Alreck and Settle 1985, pp. 69-70; Dommermuth 1975, p. 19; Cochran 1977, p. 135).

In summary, among the sample survey methods of estimating travel expenditures, exit surveys are the best at limiting recall bias. However, the difficulty in projecting sample results to the total population is not resolved in any of the three kinds of traveler surveys.

Household surveys solve the projection problem, but fall short on the recall bias issue. If a household survey is the chosen direct observation method, telephone surveys with minimum recall periods (one month at most) among national probability samples are the preferred mode.

This author believes none of the interview methods discussed above can provide reasonably accurate travel expenditure information, with the possible exception of the exit survey limited to 24-hour recall. Fortunately, there are other techniques available for estimating travel expenditures.

BANK RETURN ESTIMATES OF TRAVELER SPENDING

A number of countries measure foreign visitor expenditures within their borders through accounting for foreign exchange purchases by these visitors (World Tourism Organization 1986, pp. 195-196). The central bank attempts to compute the amount of national currency sold to visitors each period through reports from agencies making such currency sales.

The validity of this method is dependent on all entities selling currency to visitors reporting these sales accurately, making sure to exclude any non-related sales. In practice, this method fails because of the multitude of ways tourists can obtain national currency outside of

this system: the black market; from hotels, shops and another unofficial commercial sources; through advance or deferred payments for services; bringing currency in from previous visits; purchases through tour operator and travel agencies (World Tourism Organization 1986, p. 198).

These, and the fact that the bank return method can only suggest total foreign visitor spending and neither categories of this spending or any domestic spending estimates severely limits the usefulness of this method in most studies of tourism economic impact.

RESIDUAL RECEIPTS MODELS

A model for estimating total visitor expenditures in a county using secondary data has been suggested by Kreutzwiser (Smith 1989, pp. 280-288). It is based on the assumption that total receipts of retail and service establishments in a county is greater than the expenditures by county residents in these establishments. By rearranging the identity that total establishment receipts equals sales to residents plus sales to nonresidents, the method subtracts resident spending from the total to leave visitor spending as a residual.

The method begins by multiplying total household income in a county by the percent of this income spent on retail goods and services. Both of these numbers can be obtained from public economic development agencies. Then, this total is subtracted from the sales of retail and service establishments in the county, and this residual is the amount attributable to visitors to the county.

If we wish to compute visitor expenditures to a collection of counties ("region"), the process is more complex. We must subtract spending by residents of one county in the region in another county. Kreutzwiser uses the geographic circulation patterns of all of the newspapers in the major city or metropolitan area in the region to suggest such resident purchase patterns. The percent of total newspaper circulation outside the city but within the region is used to calculate how much city residents spend outside the city but within the region. This is subtracted from the first residual to obtain a second residual, the retail and service receipts attributable to visitors from outside the region.

The drawbacks of this approach include the fact that it is applicable only to a single city or county or a small collection of adjacent counties, and that it cannot break out expenditures by type of goods or services purchased, type of establishment patronized by visitors, or by type of traveler (business versus leisure; overnight versus day trip, domestic versus international, etc.). In the case of single-county studies, it defines a "visitor" as anyone who travels into the county from outside and makes a retail or service purchase. This might involve a trip of one mile or 100 miles.

Moreover, there are cases of a rural county lacking a major retail center where residents spend *more* of their income outside the county than within it. In such a case, subtracting an estimate of residents' purchases from county sales produces a negative number, suggesting visitors are being paid by businesses to visit the county.

Finally, the method is flawed from a measurement standpoint. Residuals are notoriously volatile: witness corporate profits from year to year. Measurement errors, as well as underlying behavior, are likely to produce large swings in the estimates that are not related to visitor activity.

SEASONAL DIFFERENCE MODELS

An expenditure estimation method suggested by Mueller (1977) requires looking at the monthly distribution of the receipts of a type of travel-related business (*eg.*, hotels/motels, eating and drinking places, amusement and recreation services) over a year's time to determine the month with the lowest total. This monthly total is assumed to represent average monthly sales to local residents. This amount is subtracted from the totals for each of the other months, and the residual is visitor or traveler spending.

This method is not used much today because of its structural flaws. It tends to *underestimate* traveler spending to the extent that the low month receipts include some traveler spending. A summer resort area's hotel/motel receipts in February, for example, surely includes the spending of some business travelers. When these receipts are subtracted from other months, this spending is not accounted for.

This method tends to *overestimate* traveler spending to the extent that receipts in the peak months are inflated by non-visitor purchases. For example, amusement and recreation service receipts are higher in the summer in many areas because local residents spend more time out of doors then or take their vacations at home. Sales of restaurants and other establishments may be higher in July than February because of non-tourist, weather-related business activity, such as construction or water transportation. Construction employment often soars in the summer, and this would provide a boost to restaurant sales that is not tourism-related.

The method also ignores the impact of trend on the monthly distribution of receipts. If the local economy is growing over time, then July sales of many businesses will be somewhat higher than February's due to more local activity rather than tourism.

Finally, the method works "best" in areas with clearly defined tourist seasons. The theory cannot apply in areas that have summer and winter seasons, such as many major ski resorts in the U.S..

SUPPLY SIDE JUDGMENTAL MODELS

The British Columbia Ministry of Development, Trade and Tourism has developed a *Tourism Satellite Account* to measure economic impact (Burd 1991). Satellite accounts are basically sets of supplementary information tied to the main set of a nation's economic accounts (called the "system of national accounts," or "SNA") that display the stocks and flows that comprehensively characterize a national or regional economy (Carson and Grimm 1991). They feature data for a whole field of economic activity in more detail than can be shown in the main SNA. A transactor or transaction is included only if it is linked to the field. While they present information in ways different from the main accounts, they contain at least one measure that is

also in the main accounts. A number of organizations are working on tourism satellite accounts, most notably Statistics Canada and the Organisation for Economic Co-operation and Development (Lapierre, *et al.* 1991; Tourism Committee 1991).

The British Columbia model is a separate input-output model specifically designed to display tourism's contributions to the province, but related to the overall provincial input-output model (see discussion of input-output models below). It embodies three steps to determine the economic impact of the tourism industry: (1) identify the types of businesses comprising the tourism industry; (2) measure the output, GDP, and other measures of economic impact of these businesses; (3) estimate the proportion of these measures for each business type that can be attributed to tourism expenditures (Burd 1991, p. 13).

The first two steps are straightforward and follow commonly accepted principles of definition and input-output model data collection. The third step, however, relies on the judgment of "experts." Apparently, such a panel has developed a set of ratios of business revenues attributable to tourists to total revenues for each type of business (*ibid.*, p. 15). These "tourism ratios" are then applied to the supply-side measures of output, value added, taxes, wages paid, etc., for each type of business and summed to derive the total direct impact of tourism spending.

This adds a large element of subjectivity to what is basically an objective enumeration process. It is impossible to assess the accuracy of these estimates at the national level. If it were possible, the actual tourism ratios would be used rather than the judgmental ones. Moreover, a different panel of experts might arrive at significantly different ratios. Finally, these ratios can be expected to differ considerably among areas. For example, a larger of proportion of restaurant sales in Las Vegas are attributable to tourists than is true in Minneapolis.

Apparently, the World Travel and Tourism Council similarly uses judgment in developing its estimates of global tourism expenditures and impact (Burd 1991). The Council's tourism ratios differ markedly from the Canadian ones, but there is no way to determine which set is more applicable to an area.

TRAVEL EXPENDITURE SIMULATION MODELS

The methods of estimating visitor expenditures discussed above rely on observing the traveler spend (direct observation), on asking the traveler to recount his expenditures (sample surveys) or on using secondary data (bank return estimates; Kreutzwiser; seasonal difference). There are two approaches that *simulate* expenditures by employing logic and algebra. They use a combination of survey data, secondary data, and common sense to derive measures of traveler or visiting spending. These models may be called *expenditure ratio models* and *cost factor models*.

EXPENDITURE RATIO MODELS

These expenditure estimation models rest on a foundation of certain expenditure-related data which are readily available and relatively sound. To this is added a superstructure of travel expenditure relationships that build up to a total of all travel spending in an area.

The simplest version of this approach comprises four steps. The first step is to gather data on hotel/motel room receipts in an area, such as a county or metropolitan area. This can often be obtained from state or local tax agencies, particularly if the jurisdiction imposes a special sales tax in these receipts. The second step is to conduct a survey among visitors to the area to obtain estimates of the total amount spent in the area and expenditures on lodging at hotels and motels. In the third step, the ratio is computed of total visitor spending from the survey to the survey estimate of spending on hotel/motel rooms. Finally, the fourth step is to multiply this ratio by the hotel/motel room receipts gathered in step one, and the product is total spending by visitors in the area.

The leverage associated with this naive approach can be quite high. For example, U.S. Travel Data Center estimates for traveler spending in Tennessee for 1990 suggest total traveler spending is 7.6 times hotel/motel room receipts in the state. This indicates every dollar of estimated spending on hotel/motel rooms translates into $7.60 of total traveler spending in the state. Should the estimate of hotel/motel receipts and the ratio of total spending to these receipts each erroneously be 5 percent too high, this would add $580 million in unwarranted expenditures to the state total.

In order to reduce this leverage, researchers develop expenditure ratios for each type of accommodation. For example, Dean Runyan Associates develops the ratios for the following accommodation categories in its Regional Travel Impact Model (Dean Runyan Associates 1992):

Hotel, motel, resort, bed and breakfast establishments
Commercial campgrounds
Public campgrounds
Homes of friends/relatives
Day visitors

Where receipts data are not available, this is estimated by multiplying measures of annual daily occupancies by estimates of daily expenditures from traveler surveys (*ibid.*)

Another problem occurs when the survey respondent does not accurately report hotel/motel room rental expenses (Runyan 1988, pp. 211-212.). If respondents tend to understate or overstate these costs, the resulting estimates of total traveler spending in the area will be overestimated or underestimated, respectively.

Other models embodying the expenditure-ratio approach include the T-Map-I model operated by Davidson-Peterson Associates since 1988, and the TRAITS-II model developed by Dr. J. Rovelstad (West Virginia University 1981). They differ in how they gather the foundational data and how they handle the particularly difficult estimation problems of visitors staying in homes of friends and relatives, and day visitors. It is difficult to evaluate these two models because few details on their structures and input data have been published.

The validity and estimation accuracy of this approach for local areas is improved if the following criteria are satisfied:

1. The survey sample is large enough to produce relatively accurate estimates of the total-expenditure-to-lodging-receipts ratio for individual areas.

2. The survey response rate exceeds 70 percent (Burke 1987, p. 300; Ellerbrock 1981, p. 39; Hunt and Dalton 1983, p. 16; Woodside and Ronkainen, 1984, p. 35).

3. Survey respondent recall bias does not distort this ratio.

4. Surveys are conducted annually rather than assuming the ratio remains stable over time.

5. The hotel/motel room receipts data are accurate for a particular year and not distorted by payment of past taxes and penalties for previous periods, or under-reporting.

6. Survey respondents only report what they spent in the area rather than total trip expenditures or spending in other areas.

COST FACTOR MODELS

The cost factor model for estimating travel expenditures has a long history. It was first proposed by Church in 1969. Frechtling reported on the U.S. Travel Data Center's National Travel Expenditure Model in 1973, and the structure of the model, now termed the "Travel Expenditure Component of the Travel Economic Impact Model (TEIM), was published in 1975 (Frechtling 1973; Frechtling, *et al*., 1975a,b). About the same time, Tourism Canada announced the outline of its own cost factor model, called the "Tourism Expenditure Model" (Chau 1988). In 1991, the U.S. Travel Data Center completed a major revision of the TEIM under contract to the U.S. Department of Commerce. This revision extended the Travel Expenditure Component's expenditure categories and incorporated current functional relationships and more reliable and timely data (Travel Data Center, U.S. 1991b).

A "travel expenditure" is assumed to take place in the Component wherever a person on a qualifying trip ("traveler") consumes a travel-related good or service. In most cases, this is where he exchanges money or executes a credit transaction for the product. This is also where the product is produced, since the production and consumption of most tourism services are inseparable (Morrison 1989). A "qualifying trip" occurs when a U.S. resident travels to a place 100 miles or more away from home within the U.S., or on an overnight trip in the U.S. involving one or more nights in paid accommodations regardless of distance.

Travel expenditures are estimated for 19 different items in six basic expenditure categories: public transportation, auto transportation, lodging, food, entertainment/ recreation, and incidental purchases (Table 1). Total travel expenditure is the sum of all expenditure categories.

Table 1: Travel Expenditure Categories in the Travel Expenditure Component

A. Public transportation
    1. Air, both commercial and general aviation

2. Intercity bus and motorcoach
3. Intercity rail (Amtrak)
4. Cruise ship
5. Taxi/limousine service

B. Auto/truck/RV transportation
1. Own vehicles
a. Operating costs
b. Attributable fixed costs
2. Rental vehicles

C. Lodging
1. Hotels, motels, motor hotels, resort hotels
2. Rented condominiums and vacation homes
3. Camper, trailer or recreational vehicle (RV)
4. Own second home

D. Food
1. Prepared food from restaurants, etc.
2. Unprepared food from grocery stores, etc.

E. Entertainment/recreation
1. Admission fees at theme and amusement parks
2. Snow ski lift tickets and lessons
3. Casino gaming
4. Other entertainment and recreation expenditures

F. Incidentals, such as medicine, cosmetics, clothing, personal services and souvenirs.

The Travel Expenditure Component (TEC) can be thought of as a set of equations for each state where the independent variables are the levels of various travel activities (*eg*., miles traveled by automobile, nights spent in hotels), the coefficients are the costs per unit of each activity (called "per-unit cost factors"), and the dependent variables are travel expenditures for certain categories of travel-related goods and services ("expenditure items").

For example, the Travel Expenditure Component of the TEIM estimates what each traveler spends on meals in restaurants and other foodservice establishments, and on groceries in each state. This is defined to be the product of the number of days the traveler spends in each state, and average cost per day of food in the state, as shown in the following equations:

$$TFSS_s = TRLPN_s * fscf_s \quad (1)$$

$$TGSS_s = TOLPN_s * gscf_n \quad (2)$$

$$TMS_s = TFSS_s + TGSS_s \quad (3)$$

s = one of the 50 states or the District of Columbia
n = nationwide
TFSS = traveler spending in foodservice establishments
TRLPN = traveler person-nights spent lodging in hotels, motels and rental vacation homes and condominia
fscf = average cost per person per day of three meals
TGSS = traveler spending in grocery stores
TOLPN = traveler person-nights spent with friends/relatives, in campgrounds, and in own second homes
gscf = average cost per-day of groceries on trips away from home
TMS = total traveler spending on meals

Equation (1) states that traveler spending in a state on meals in foodservice establishments (*i.e.*, eating and drinking places) equals the product of person-nights spent in the state in rental accommodations and the average cost of three meals in the state. The former magnitude is derived from the Data Center's National Travel Survey. The average cost for three meals in each state is obtained from Runzheimer International. The number of days each traveler remains in a given state is assumed equal to the number of person-nights (one person spending one night on a trip in a state).

Equation (2) indicates that traveler spending in a state for food in grocery stores equals the number of person-nights spent in the state in the homes of friends and relatives, in campground and in own second homes multiplied by the average expenditure per person per day of U.S. residents traveling away from home as estimated by the U.S. Department of Labor Consumer Expenditure Survey.

Equation (3) simply sums the two estimates of meals spending to derive total expenditures on food in a state.

Similar equations simulate travel spending in 14 of the expenditure items. For five of the expenditure items, direct estimates of annual traveler spending in each state are available and are incorporated directly in the model. These include hotel/motel room revenue, Amtrak passenger sales, cruise ship passenger sales, admission fees at theme and amusement parks, and casino gaming expenditures.

The model allocates travel expenditures to states by simulating where the exchange of money for goods or services actually took place. According to their nature, some travel expenditures are assumed to occur at the traveler's origin, some at his destination, and some enroute. Table 2 summarizes the allocations for the individual expenditure categories.

Table 2: Allocation of Travel Expenditures by Category in the Travel Expenditure Component

A. To the origin State
    1. Auto/truck/RV fixed costs
    2. Air transportation fares and expenses (part)

3. Taxi/limousine fares (part)
4. Intercity bus/motorcoach fares (part)
5. Intercity rail fares (part)
6. Cruise ship fares
7. Auto rental expenses (part)

B. To the destination State
   1. Air transportation fares and expenses (part)
   2. Taxi/limousine fares (part)
   3. Intercity bus/motorcoach fares (part)
   4. Intercity rail fares (part)
   5. Auto rental expenses (part)

C. To States visited (including destination State)
   1. Auto/truck/RV variable costs
   2. Hotel/motel lodging expenses
   3. Campground rental and hook-up expenses
   4. Own second home imputed rent
   5. Food expenses
   6. Entertainment/recreation expenses
   7. Incidentals purchases

The Travel Expenditure Component also produces estimates of traveler spending for individual counties and cities in a state. The statewide estimate for each expenditure item is allocated to a county based on a relevant indicator of travel activity in the county. For example, traveler spending on meals in foodservice facilities in a county is that proportion of statewide spending on these meals equal to the county's proportion of statewide receipts from rentals of hotel/motel rooms and vacation homes.

The Travel Expenditure Component estimates are constrained by the definition of a trip, the individual expenditure categories included, and by the nature of the National Travel Survey. This latter limits expenditures to those by U.S. residents while traveling in the U.S. However, the last revision of the TEIM added a foreign visitor expenditure component based on the U.S. Travel and Tourism Administration's annual surveys of foreign visitors. These surveys ask visitors what they spent while in the U.S. as they are returning home, thus keeping expenditure recall decay to a minimum.

SIMULATION MODELS OF TRAVEL'S ECONOMIC BENEFITS

Travel expenditures by themselves tell us relatively little about the economic benefits of tourism to an area. One reason is that businesses may use most of their receipts generated by visitor expenditures to purchase goods from outside the area, leaving little impact in the local economy. Another reason is that traveler expenditures tell us little about the employment produced. For example, the Data Center's 1987 TEIM estimates indicated that $1 million spent by travelers on meals directly generated 29 jobs in foodservice facilities, but the same

expenditure on auto transportation supported fewer than five jobs. Along with the fewer jobs in the latter go fewer dollars of income attributable to the traveler spending.

Once traveler expenditure estimates are produced by the appropriate expenditure model, the economic impact they generate can be simulated. The essence of building a model for estimating the economic benefits of tourism in an area is to abstract the major relationships operating among travel expenditures, employment, labor earnings, profits and tax revenue. Most of these relationships are straightforward and vary only by the quality of the input data. For example, a given amount of travel-generated employment in a business in an area will produce a certain amount of wage and salary income. The objective is to obtain the best data quantifying the relationship.

INTEGRATED VERSUS PARTIAL MODELS

We can develop methods to estimate one aspect of economic impact, such as travel expenditures or travel-generated employment. These may be called *partial* models. Alternatively, we can develop an *integrated* model that simulates the linkages among travel spending and a number of its economic effects, including employment, income and tax revenue.

Partial models have the advantage of being simple and inexpensive compared to integrated models. Fewer input data are required, fewer interrelationships among variables need to be simulated, and a fixed amount of time and money can produce higher quality estimates.

The major disadvantage, and it is a large one, is that the one economic magnitude estimated is emphasized at the expense of other aspects of impact. Partial models are most frequently built to estimate travel spending, and less frequently, travel-generated employment. Travel expenditures tell us very little about the economic contribution travel makes to an area, as noted above. In an extreme case, such as small island economies which import nearly all productive goods, services and capital, travel expenditures produce little or no economic benefit for the residents.

Travel-generated employment is a useful measure of economic contributions of travel to a community. There is an explicit commitment at all levels of government to fostering employment opportunities for residents. This commitment has spawned several partial models aimed at estimating only the employment attributable to travel and tourism (Mueller 1977; Ellerbrock and Hite 1980).

It is a mistake to raise this measure above others characterizing travel's economic benefits. In the final analysis, we are not interested in the jobs generated for their own sake, but for the earnings these jobs provide. Community leaders should prefer one thousand travel-generated jobs paying $10,000 each to two thousand jobs paying $4,000 each.

Jobs generated by travel and tourism run the gamut from among the lowest hourly wages (eating and drinking places in the U.S.) to the highest (air transportation). Knowing how many jobs are attributable to tourism may well be a highly misleading indicator of the actual income earned by those holding them, and it is income that is the more revealing measure of travel's contribution to economic well-being, although not sufficient in itself.

Integrated models, admittedly more difficult to construct and more expensive to operate, have the advantage of simulating a number of relationships in the economic world. Relationships among the important economic measures of travel's contributions -- business receipts, employment, earnings, profits, tax revenue -- are specified in a logically consistent framework. We then have a number of measures of travel's economic benefits to work with in evaluating the importance of this activity to the residents of an area, with all measures consistent with one another. Moreover, all of the relationships in the model can be examined for validity.

TRAVEL ECONOMIC IMPACT MODEL

The Travel Economic Impact Model (TEIM) is a large integrated model developed by the U.S. Travel Data Center to produce detailed estimates of the economic benefits of travel away from home by U.S. residents on the U.S. economy, as well as state and local areas. It is an attempt to satisfy the five evaluation criteria discussed in the previous chapter.

Development of the TEIM began in 1972, when the Data Center assembled a team of researchers to design the National Travel Expenditure Model. This model, later re-named the Travel Expenditure Component (TEC) of the TEIM, aimed to provide annual estimates of U.S. domestic traveler spending on a consistent basis for each state and the nation.

In 1975, the Data Center added the Economic Impact Component and the Fiscal Impact Component to the TEIM and extended it to produce estimates for counties and cities. This work was initially done under a contract with the Bureau of Land Management, U.S. Department of the Interior (Frechtling et al. 1975a,b). In 1991, the Data Center completed a major revision of the TEIM, adding expenditure components, updating impact relationships, and utilizing improved input data then available (Travel Data Center 1991a).

The TEIM has four components:

1. Travel Expenditure Component (TEC) -- provides estimates of U.S. travel spending in each state or local area, as discussed above;

2. Economic Impact Component (EIC) -- provides estimates of the business receipts, employment and payroll income generated by travel spending in each state.

3. Fiscal Impact Component (FIC) -- provides estimates of federal, state and local tax revenue generated by travel spending in each state.

4. City/county Impact Component (CIC) -- provides estimates of travel spending and the employment, payroll and tax revenue generated by this spending in individual cities or counties.

TEIM estimation starts with the travel expenditure estimates of the TEC, as discussed above. U.S. tourists can travel by air, bus, rail, ship, personal motor vehicle, or some

combination of these. They can spend the night in the homes of friends or relatives, hotels/motels, campgrounds, own second or vacation homes, or enroute. They can take taxicabs, rent cars, purchase meals, go skiing, and buy gifts and other incidentals. All of these activities give rise to travel expenditures and are included in the TEIM.

Table 3 shows how the 19 travel expenditure items discussed above are directly related to 15 types of businesses, or the "tourism industry." The U.S. Standard Industrial Classification (SIC) codes, designed to classify establishments by the type of activity in which they are engaged, are shown in parentheses (Office of Management and Budget, U.S. 1987).

Several advantages arise from relating travel expenditures to individual SIC codes. One is that there is a wealth of data published by national and state agencies on the size, operations, and other characteristics of businesses by SIC code. This permits direct comparison of tourism-generated business receipts in, say, the eating and drinking place industry (SIC 58) to total receipts of this industry within a city or state.[2] Another advantage is that SIC data assist in constructing integrated travel impact models, as illustrated in the discussion of the TEIM that follows.

Finally, relating travel spending to SIC codes is vital to national and international recognition of tourism as an important social and economic activity. Most national economic statistics in the world are based on supply-side reporting. (Pisarski 1991, p. 3) This requires an industrial classification system to insure exhaustive coverage. Indeed, the World Tourism Organization has submitted its design for a "Standard International Classification of Tourism Activities" to the United Nations Statistical Commission for endorsement as "essential to the proper and effective statistical representation of tourism" (World Tourism Organization 1991, p. 9).

Economic Impact Component

TEIM procedures for estimating business receipts, payroll and employment income are standard across most expenditure categories and types of businesses, and are termed the "Economic Impact Component."

Business receipts generated by U.S. travel spending as estimated in the TEIM follow the U.S. Bureau of the Census definition for service establishments, excluding sales, occupancy, admission, and other taxes collected from customers. (Bureau of the Census, U.S., 1989, p. A-3)

The standard equation for computing business receipts generated by travel in a state for a type of tourism business is as follows:

$$TBR_{i,s} = TES_{i,s} - TRST_{i,s} \qquad (4)$$

i = one of the types of travel-related businesses

[2]For example, every year ending with a "2" or a "7", the U.S. Bureau of the Census conducts a large-scale census of business, including retail trade, service, and selected transportation establishments. Estimates of business receipts, payroll and employment are provided down to the city and county level. (*eg*., Bureau of the Census, U.S., 1991, 1990)

s = one of the states or the District of Columbia
TBR = business receipts generated by U.S. traveler spending
TES = expenditures by U.S. travelers
TRST = retail sales taxes generated by U.S. traveler spending

Equation (4) states that the receipts for a specific type of business in a state generated by traveler spending are equal to the travel expenditures affecting that business less the retail sales taxes generated by that spending. These taxes are estimated in the Fiscal Impact Component of the TEIM, as indicated below.

Business receipts for air transportation (SIC 45) are estimated in a different manner because the relationship between travel expenditures (ticket purchase) and airline business receipts is geographically much more complex. In common carrier transportation, the service is consumed across as many geographic boundaries as the traveler passes. It is not feasible to allocate this spending over all such areas. Instead, the travel expenditure is assumed to take place where the ticket is purchased in the TEIM. Since most common carrier tickets are for round-trip travel, most of this spending occurs at the traveler's origin, and a minority is allocated to the destination in recognition of one-way return tickets purchased.

While this particular convention works reasonably well for expenditures, its applicability to the other measures of impact is not so clear. When a traveler purchases a round-trip ticket in Washington, D.C. for a trip on United Airlines to San Francisco, this gives rise to employment and income in Washington, San Francisco, the Chicago area where United's headquarters are, and other cities housing the airline's maintenance facilities, flight personnel, training centers and regional offices. Equation (4a) attempts to deal with these complexities:

$$TATR_s = \frac{ATPR_n}{ATR_n} * \frac{ATP_s}{atec_s} \qquad (4a)$$

s = one of the fifty states or the District of Columbia
n = nationwide
TATR = air transportation business receipts generated by traveler spending
ATPR = U.S. airline passenger revenue
ATR = total U.S. airline operating revenue
ATP = total air transportation (SIC 45) payroll
atec = earnings coefficient for air transportation from RIMS II

The first term on the right side of equation (4a) removes non-passenger revenue from U.S. airline total operating receipts. The second term divides payroll earnings in the airline sector by the RIMS II earnings coefficient for the state to obtain a measure of business receipts actually generated in the state. RIMS II is an interindustry model maintained by the U.S. Department of Commerce, and its earnings coefficient for an industry represents the ratio of labor earnings (payroll income) to business receipts for the industry. The estimate of annual payroll income for air transportation in each state is obtained from the U.S. Department of Labor.

Consequently, equation (4a) decouples traveler spending on air transportation from the business receipts generated by them in a state. It summarizes all of the relationships extant in the country between airline ticket purchases and air transport receipts, employment and payroll in the states.

The estimation of economic benefits continues by estimating the payroll earnings attributable to travel spending in each category in each state. Payroll in the Economic Impact Component is defined as the U.S. Census Bureau defines it, including all forms of employee compensation, and before deductions of payroll taxes (*ibid*.). However, the TEIM adds a measure of the compensation of proprietors or partners of unincorporated businesses in its travel-generated payroll estimates.

The standard equation for computing payroll income generated by travel in a state for a type of tourism business is as follows:

$$TP_{i,s} = TBR_{i,s} * \frac{PR_{i,s}}{BR_{i,s}} \qquad (5)$$

i = one of the types of travel-related businesses
s = one of the fifty states or the District of Columbia
TP = travel-generated payroll
TBR = travel-generated business receipts
PR = total payroll
BR = total business receipts

Equation (5) defines travel-generated payroll for an industry in a state as equal to travel generated business receipts multiplied by the ratio of payroll to business receipts for that industry in that state as published by the U.S. Bureau of the Census or other sources.

Next, employment generated by travel spending is estimated by relating jobs to payroll. In effect, the proportion of a job supported by a dollar of payroll is estimated for each industry in a state, and multiplied by the travel-generated payroll estimated in the previous component, as indicated in equation (6):

$$TE_{i,s} = TP_{i,s} * \frac{EM_{i,s}}{PR_{i,s}} \qquad (6)$$

i = one of the types of travel-related businesses
s = one of the fifty states or the District of Columbia
TE = travel-generated employment (jobs)
TP = travel-generated payroll
EM = total employment (jobs)
PR = total payroll

Equation (6) states that travel-generated employment in one of the travel-related industries in a state is equal to travel-generated payroll for the industry in the state multiplied by the ratio of total employment to total payroll for that industry in the state. The data for

statewide payroll and employment for each type of business is obtained from the U.S. Department of Labor.

Employment is defined as the Census Bureau defines it in its censuses of business: all full-time and part-time employees, including salaried officers and executives of corporations who were on the company payroll. The TEIM adds a measure of the proprietors and partners of unincorporated businesses who owe their jobs to tourism-generated receipts.

Fiscal Impact Component

The Fiscal Impact Component of the TEIM estimates the tax revenue generated for national, state and local governments by travel expenditures in the U.S. Considerable amounts may be generated for local governments. Indeed, one study found the tax burden on residents was considerably lower in counties where tourism development was high (Perdue *et al*. 1991, p. 200).

This component considers the income, sales, excise, and property tax implications of dollars spent in each of the expenditure categories or earned in each of the industry categories. The taxes covered are:

Federal
- Individual income and employment taxes
- Corporate income tax
- Gasoline excise tax
- Air transportation excise tax

State
- Individual income tax
- Corporate income tax
- Gasoline excise tax
- Sales and gross receipts taxes

Local (includes counties and municipalities)
- Individual income tax
- Sales and gross receipts taxes
- Property tax

The rates prevailing for these taxes in each state, locality and the industry sectors to which they apply are obtained through surveys of governments and entered into this component. The following details the general approach for the major taxes estimated in the model (Travel Data Center 1991b).

For excise, sales, and gross receipts taxes, the standard equation is for an industry subsector subject to this tax is:

$$TSST_{i,s,g} = TES_{i,s} * \frac{t_{i,s,g}}{1 + \sum_{g} t_{i,s,g}} \quad (7)$$

where
i = one of the types of travel-related businesses
s = one of the fifty states or the District of Columbia
g = federal, state or local government
TSST = excise, sales, or gross receipts tax revenue attributable to travel spending
TES = travel spending
t = applicable tax rate

The denominator of the final term in equation (7) -- $(1 + \sum t_{i,s,g})$ -- removes tax payments included in the travel expenditure so the rate is applied to the purchase price not to the price plus the sales tax.

At this point, business receipts attributable to travel spending can be computed, as they are defined to be net of sales taxes, one component of the taxes estimated here.

Travel-generated individual income and employment tax revenue is estimated by developing the average rate of these taxes as a percent of personal income in the state and applying this to travel-generated payroll. The equation for the hotel/motel sector is

$$TIIT_{s,g} = TP_{a,s} * \frac{IIT_{s,g}}{PY_{s}} \quad (8)$$

where
s = one of the fifty states or the District of Columbia
g = federal, state or local government
a = total for all industries
TIIT = individual income tax and employment tax revenue generated by payroll attributable to travel spending
TP = payroll attributable to travel spending
IIT = total individual income tax and employment tax collections
PY = personal income.

Equation (8) is used to estimate federal, state or local income taxes attributable to traveler spending in the state. Total travel-generated payroll in a state is multiplied by the ratio of federal, state or local individual income tax receipts to personal income in the state -- the implicit average tax rate.

To estimate corporate income tax revenue attributable to travel spending, data are collected from the U.S. Internal Revenue Service and the states on the relationship of corporate income tax payments to business receipts, by type of business. Equation (9) presents the method used for a single type.

$$TCIT_{i,s,g} = TR_{s} * \frac{CIT_{i,s,g}}{BR_{i,s}} \quad (9)$$

where
i = one of the types of travel-related businesses
s = one of the fifty states or the District of Columbia
g = federal, state or local government
TCIT = corporate income tax revenue attributable to travel spending
TR = business receipts attributable to travel spending
CIT = corporate income tax collections
BR = total business receipts

Local governments generally rely most heavily on property taxes for revenue. Property taxes are normally paid by residents out of personal income. The income earned by residents in a location enables them to pay their annual property taxes. It is assumed that the amount of property tax a resident pays is proportionate to his income, including that earned in a job attributable to travel spending.[3]

Equation (10) details the estimation technique for a state:

$$TPT_s = TP_{a,s} * \frac{\sum_g PT_{s,g}}{PY_s} \qquad (10)$$

where
s = one of the fifty states or the District of Columbia
g = state or local government
a = total for all industries
TPT = property tax revenue attributable to travel spending
TP = attributable to travel spending
PT = property tax revenue
PY = personal income

The state and local property tax revenue in a state attributable to travel spending is set equal to the product of total travel-generated payroll and the implicit tax rate to personal income.

This completes the TEIM estimates of travel's economic contributions at the state and national level. To produce county or city estimates of travel impact, the state totals in each impact category are distributed to a particular locality based upon available measures of business activity in the area. For example, for travel expenditures on hotel/motel lodging, the relevant expenditure equation is

$$THLS_l = THLS_s * \frac{HLR_l}{HLR_s} \qquad (11)$$

where

[3]This approach to estimating local property tax revenue attributable to the presence of a specific economic activity in a local area was used in the economic impact model developed by the Commission on the Review of the Federal Impact Aid Program, *A Report on The Administration and Operation of Title I of Public Law 874, Eighty-first Congress*, Washington, D.C., 1981, p. H-6.

l = any locality in the state
s = one of the fifty states or the District of Columbia
THLS = traveler spending on hotel/motel lodging
HLR = total hotel/motel receipts.

Data are not generally available on the relationships among business receipts, payroll and employment by industry at the local level. Consequently, the statewide relationships are assumed to hold, and equations similar to equation (11) are used to distribute travel-generated payroll and employment by industry among the localities.

Federal and state tax revenue attributable to travel are similarly distributed among the localities. However, local sales, use, excise, gross receipts, individual and corporate income, and property tax rates are entered for each locality and estimated directly.

EVALUATION OF THE TEIM

The evaluation criteria developed in the previous chapter can be applied to assess the quality of the Travel Economic Impact Model.

Relevance

The TEIM was developed to provide estimates of travel or visitor impact alone. It is based upon surveys of travel activity, rather than receipts of travel-related businesses. Some studies have begun with explicit estimates of the proportions of hotel/motel, restaurant, entertainment services, and other business receipts attributable to travelers. These proportions are generally subjective, and often approach pure conjecture. In the TEIM, such proportions can be implicitly derived from the output but are not input assumptions in the model.

Ensuring that the economic impact estimates actually relate to the geographic area under study is difficult in travel research. Some travel expenditures are made at home in anticipation of the trip, some are made enroute, and some may even occur after the trip (e.g., developing photographs of the trip). Moreover, travelers may pay for their trip at home or enroute by currency, check, or credit card. Determining where travel expenditures should be allocated requires special research effort.

The primary rule or convention for travel spending in the TEIM is that the expenditure takes place where the goods or services are actually consumed. If this rule cannot be applied, then the expenditure is assumed to take place where the service is purchased. Table 2, above, indicates these assumptions embodied in the TEIM.

The primary rule works well for all items except common carrier transportation. Hotel expenditures are assumed to take place where the traveler spends the night. Gasoline purchases are made where traveler visits by car, truck or recreational vehicle. Meals, amusement and recreation, and incidentals are similarly handled.

In common carrier transportation, the service is consumed across as many geographic boundaries as the traveler passes. It is not feasible to allocate this spending and its impact over

all such areas. Instead, the travel expenditure is assumed to take place where the ticket is purchased in the TEIM. In the absence of the research that would trace the geographic impact of airline ticket purchases over all of these areas, the TEIM assumes (equation 4a) impact follows the geographic presence of payroll and employment, not ticket purchases.

Care is taken in the TEIM to specify whether the local estimates are of *traveler* impact or of *visitor* impact. If the latter, state-level travel expenditures for each industry sector are adjusted to represent the amount attributable to non-residents entering a state or local area. This is particularly important for common carrier expenses, auto ownership costs and travel agency services.

Coverage

This criterion is applied to determine how comprehensive a model is in providing estimates of all economic impacts of travel. A partial model will necessarily provide incomplete coverage of benefits. An integrated model may fail to treat certain classes of impact, and this can be due to either lack of necessary input data or deficiencies in the model's structure.

The TEIM produces travel expenditure estimates for 19 categories of goods and services (Table 3). However, two important classes of travel-related expenses are not estimated in the model due to lack of sufficient data. Consumers purchase certain goods and services in anticipation of a trip away from home. These include sports equipment (tennis racquets, skis, scuba gear, etc.), clothing (tennis clothes, ski togs, bathing wear, etc.), travel books and guides, and services such as language lessons and lessons for participatory sports (tennis, skiing, underwater diving, etc.). Although the magnitude of these purchases in preparation for a trip cannot now be quantified, it is probably significant, particularly in major urban centers and states.

The second type of spending not covered due to lack of sound, relevant data is the purchase of major consumer durables generally related to outdoor recreation on trips. While recreational vehicles (campers, motor homes, trailers and mobile homes) are covered, spending for boats and boating supplies and off-road recreational vehicles such as trail bikes, dune buggies and snowmobiles are not. Further research is required in this area to estimate the average spending on items such as these by travelers.

The TEIM records travel expenditures only for those states where travelers spend the night, originate, or are destined. Due to the nature of the National Travel Survey, expenditures cannot be allocated to states passed through in a single day. It is believed these expenditures may be significant in certain "bridge" states between major population concentrations and major destinations, with relatively little destination or stopover expenditures.

Among the benefit measures, the TEIM does not provide estimates of travel-generated profits, dividends, or interest payments in an area. Rent, the other component of personal income, is partially covered. The rent paid by travelers to owners of second homes, vacation condominiums, and like properties is included. However, the rent paid by a travel-related business to the owner of the structure housing it, is not. Again, the lack of data is the problem.

The smaller the area under study, the less of a problem exclusion of dividend, interest and rent payments attributable to travel may be. Travel may generate this income, but it is unlikely to accrue to residents of a small area. A hotel operator may borrow money from a bank in another city, and pay interest income that does not accrue to any resident of his area. Vacation home owners are virtually all non-residents of the area where the home is located, and their rental income should not show up in the area being studied.

Until 1984, little was known about the types and geographic distribution of foreign visitor expenditures in the U.S. However, the U.S. Travel and Tourism Administration's (USTTA) survey of international air travelers now provides a sound basis for estimating these expenditures by state and expenditure category (Travel and Tourism Administration, U.S. 1991). Utilizing this data base and similar data on Canadian visitors from Statistics Canada and the TEIM, the U.S. Travel Data Center has prepared estimates for USTTA of the economic impact of foreign visitors on each of the fifty states and the District of Columbia for a number of years (*eg.*, U.S. Travel Data Center 1988). Future editions of these estimates are anticipated, subject to funding availability.

The TEIM does not include a module for estimating public or government employment attributable to travel and tourism. This is because the relationship between travel activity and government employment is not evident. If there is no stable, discernible relationship, then employment in these agencies may not be related to travel activity and therefore does not belong in a model designed to estimate the economic impact of travel and tourism activity.

Perhaps relationships could be established between travel activity and employment in regulatory agencies and in government programs for constructing and maintaining travel-related facilities and rights of way. It is more difficult to speculate on the links between tourism promotion agency employment and travel activity, however.

It may be that firm relationships cannot be established at all. Governments frequently cut back on employment in travel-related agencies for budget considerations even while travel is rising. In any event, the appropriate research on the link between travel and government employment has not been conducted.

The TEIM measures tax revenue generated by travel for federal, state and local governments. It does not similarly measure travel's contribution to other government revenues. These include user fees, license fees, and fines.

Travelers pay park entrance fees, purchase hunting and fishing licenses, and pay traffic and other fines. These are all government revenues attributable to travel. However, accounting for these in a national model is a difficult task. It requires examination of detailed revenue data for each level of government, to determine the appropriate relationships. The U.S. Travel Data Center conducted such a study for the State of Delaware, but the cost makes it prohibitive for comprehensive application across all states (Travel Data Center and Fothergill/Beekhuis Associates 1979, pp. 69-104).

The TEIM covers most U.S. travel away from home overnight, and day-trips to places 100 miles or more away. It does not measure the impact of travel to destinations less than 100 miles from the traveler's home with a return within the same day. While there may be a great

number of trips of this type that may be of interest to the travel industry and others, the average expenditure per traveler is likely to be quite low, since no overnight lodging is purchased, little common carrier transportation is consumed, and other expenditures are likely to be small, being confined to a period less than one day. It is likely, therefore, that for most areas, excluding day-trips of less than 100 miles will bias the economic impact estimates little, if at all (West Virginia University 1981, p. 54).

The TEIM does not produce estimates of tourism-related investment and its impact on area employment, payroll and tax revenue. Tourism Canada's Travel Impact Model does cover these expenditures , through an application of the Keynesian accelerator concept, which assumes investment this period is a function of the rate of change of related demand in the last period (Chau 1988, p. 9). In the U.S., such a stable relationship has not been demonstrated. On the contrary, investment in hotel and resort facilities since 1983 has been influenced more by the tax treatment of this spending than underlying demand conditions.

In summary the TEIM fails to cover certain positive impacts due to lack of the necessary input data or a sound conceptual base. However, it does provide estimates of the major elements of travel's economic contribution to an area: travel-generated payroll income, employment, and tax revenue for most types of businesses serving the traveler while away from home.

Transferability

The TEIM was designed to provide estimates of travel's economic impact for any state, county or significant city in the U.S. for 1977 and subsequent years. The same approach has been adapted for use in Canada by federal and provincial governments, and in New Orleans (Chau 1988; Crawford and Nebel 1977). This suggests the model can be applied in different geographic areas.

Being quite complex, adapting the model to a certain country or other area is a difficult task. Moreover, it requires a good deal of input data which may not readily be available, particularly in lesser-developed countries.

In short, the TEIM has been used throughout the United States since 1975, either through the U.S. Travel Data Center or an adaptation of the original model. It is the only tourism impact model producing consistent annual estimates for all states. However, applicability in other countries, particularly lesser-developed ones, is questionable.

Efficiency

The TEIM was designed to be efficient. It does not require extensive primary data collection, but rather uses information available from existing government and industry data-gathering projects. It is flexible in accepting alternative sources of input data when necessary.

It has been the Data Center's experience that the Travel Economic Impact Model provides annual economic benefit estimates for states, cities and counties at costs considerably lower than alternative models.

Accuracy

We may judge the accuracy of an approach's estimates by examining the structure and input data of the approach. We may also judge its accuracy by comparing the estimates produced with independent estimates.

The TEIM structure is consistent and logical. The input data include survey results that are subject to sampling and non-sampling errors. However, survey-based data constitute a part of the input, not the whole. Other input data are derived from administrative records and complete censuses. It is difficult, therefore, to assess accuracy in terms of statistical reliability.

There are few independent estimates of travel impact we can refer to in judging the validity of the output. The TEIM was developed precisely because travel economic impact data did not exist. In the few cases where valid comparisons can be made, the TEIM appears to be somewhat conservative in its estimates, reflecting its basic assumptions.

SECONDARY ECONOMIC BENEFITS

When the traveler purchases goods and services, he produces the direct economic benefits detailed above. These direct or *primary* impacts produce *secondary* economic effects as well that add to the community's economic well-being (Fletcher and Archer 1991, pp. 29-30).

The secondary economic benefits of travel activity include *indirect* benefits, and *induced* benefits. The indirect benefits occur as the travel-related business operator, say a restaurateur, purchases goods, such as food, and services, such as electricity, in order to serve his patrons. These purchases generate economic output by food wholesalers and electric utility. In order to supply the restaurateur, the wholesalers and utility must, in turn, purchase goods and services from *their* suppliers. This chain of purchasing goods and services in order to produce continues in an area until the amount of the restaurateur's initial purchase "leaks" out of the area through taxes, purchases from suppliers outside the area (imports), business savings, distributed profits, and payments to employees. The faster the initial spending leaks out of the community's re-spending process, the smaller will be this indirect impact.

The measures of indirect impact of travel activity in an area are the output, transactions, income, employment, and tax revenue generated as businesses purchase from suppliers in order to support the initial sale to the traveler.

The other type of secondary impact is the induced economic impact of the travel expenditure. This results as the employees of the travel-related businesses, and those of suppliers along the chain of indirect impact, spend a part of their earnings in the area under study. This spending itself generates output and additional induced and indirect effects throughout the area.

The sum of indirect and induced effects constitutes the total secondary impact of travel activity .

TOURISM IMPACT MULTIPLIERS

The concept of the *multiplier* as used in recent tourism impact studies derives from a desire to summarize the amount of change in some economic benefit variable (output, income, employment, etc.) generated by a given amount of tourism spending in an area (*ibid*., pp. 30-37). There are a number of different types of tourism multipliers and three main methods for computing them. Confusion over these different multipliers has limited the usefulness of a number of secondary impact studies (Archer 1982). For example, Fletcher and Archer (1991, pp. 37-39) distinguish the following:

> *Transactions multiplier* - one of the most common forms, it is the ratio of the total change in business sales in an area to the initial tourism expenditure that generated them;
>
> *Output multiplier* - often confused with the former, this represents the total productive output generated as a ratio to the tourism expenditures; output in this sense is equivalent to sales less change in business inventories;
>
> *Income multiplier* - perhaps the most useful of all multipliers, it is the ratio of income (labor income, business profits, dividends, interest and rent) to the traveler spending that generated them; most often, the numerator is limited to wages and salaries (Fletcher and Archer 1991, p. 37):
>
> *Employment multiplier* - the ratio of jobs, either actual or full-time equivalent, produced by tourism spending to the amount of the spending; this is expressed in small decimal numbers, such as the U.S. Travel Data Center's estimate of the employment multiplier for all travel spending in the U.S. as .0000393, or 39.3 jobs for every $1 million spent (1991b).

In addition, we could compute a *government revenue multiplier* which would indicate the total amount of tax, fee, fine, license, public enterprise, and other such revenue generated by one dollar in tourist spending, either for all governments in an area or some subset (Fletcher 1989, p. 526). And Bull suggests an *asset multiplier*, which indicates the increases in an economy's stock of productive assets (1991, p. 141).

The multipliers described above are all normal multipliers: they relate the measure of total impact to the initial tourism expenditure. Researchers should beware of ratio multipliers, or the ratio of a primary plus secondary measure of impact, to the primary measure of that same impact. For example, a ratio employment multiplier would equal all employment in an area, both primary and secondary, generated by travel spending divided by employment generated directly. In the U.S. Travel Data Center example quoted above, the ratio employment multiplier would be 2.18, since 1.18 jobs are produced by secondary impact for every one job generated directly. This is magnitudes larger than the normal employment multiplier, and is of little use other than to confuse the unwary (Archer 1982, pp. 238-239).

Archer notes that economic theory suggests six factors that affect the size of tourism's impact on an area (1989, pp. 128-132):

1. the initial volume of tourism expenditure;

2. supply constraints in the area economy - if there is insufficient capacity to meet the tourism demand, the expenditure will generate local inflation and a rise in imports;

3. the size of the area economy;

4. value added in the first round - the more of the initial expenditure that is translated into income for area residents, the higher the multiplier should be;

5. tourism industry linkages with the area economy - the more industry requirements to meet tourist demand can be met by area businesses, the higher the multiplier impact;

6. leakages - the less that leaves the area economy in each round of transactions, the higher the multiplier.

As a practical matter, Archer has found that only supply constraints (item 2) and linkages (item 5) correlate closely with size of the income multiplier (*ibid*.) However, items (3) through (6) represent the interdependence of the area economy: the degree to which area businesses and employees/consumers buy and sell from one another rather from outside the area. Each of the items is only an incomplete representation of this characteristic and may not individually indicate multiplier size.

Archer's factors suggest it is a mistake to think of the "tourist" or the "tourism industry" as monolithic . Different types of tourists may have different impacts on an area economy (Bull 1991, p. 141; Fletcher 1989, pp. 518, 521). This is most likely related to the items the purchase and where they purchase them, because different subsectors of the tourism industry will have different linkages to the local economy. The extremes might be tourist purchases of gasoline for a rental car (gasoline service stations import their product and contribute little value added) and restaurants specializing in local cuisine (low import content and high value added). We can summarize this by noting the size of the multiplier is dependent on the traveler's "bill of goods," as well as the linkages of the tourism subsectors within the area economy.

TURNOVER VERSUS THE MULTIPLIER

In speaking of transactions multipliers, it is common to discuss the "turnover" of the travel dollar. This term refers to the process where the dollar spent by the traveler becomes a receipt to a business and a portion of it is, in turn, re-spent for goods and services. The suppliers of these goods and services, both businesses and employees, also re-spend part of the receipts they receive, and this continues until leakages reduce the original dollar to near zero.

There is a definite relationship between the transactions multiplier and the number of times the original dollar spent turns over before disappearing from the area. An example can make this clear. If fifty percent of the dollar disappears in leakages each time it is re-spent, then the initial dollar expenditure would produce one dollar in transactions directly, fifty cents in the

first round of the indirect impact, 25 cents in the second round, 12.5 cents in the third round, and continue in this manner until it disappears. The equation for the total impact transactions multiplier is:

$$TM = 1 + \sum_{t} (1 - L)^{t}, \qquad (12)$$

which is equivalent to

$$TM = \frac{1}{L}, \qquad (13)$$

where
TM = transactions multiplier
L = average leakage per round of spending as a percent of spending
t = number of the round.

Applying equation (12) to our fifty percent leakage example and working it out for each round, we find that the amount of the dollar left to be re-spent drops below one-half of one cent after the eighth round, that is, it effectively disappears.

Consequently, a multiplier of 2.0 (1/0.5) is equivalent to eight rounds of dollar turnover. Unfortunately, the terms are sometimes confused, and we find someone stating that for every dollar spent by tourists a total of eight dollars are generated by turnover in the area, when the correct estimate is two dollars (*eg*., Archer 1982, p. 239).

REPRESENTATIVE MULTIPLIERS

Table 4 presents a number of tourism income multipliers covering a variety of geographic areas. These indicate the ratio of income generated by tourism expenditures to the expenditures themselves for each area noted. They were derived from a variety of models, most of which were input-output models. While a comprehensive measure of income includes wages and salaries, proprietors' income, corporate profits, dividends, interest and rent, it is not known how income was defined for these estimates.

Table 4: Tourism Income Multipliers for Selected Areas of the Word

<u>Developed countries</u>	
Turkey	1.96
United Kingdom	1.73
Republic of Ireland	1.72
Egypt	1.23
<u>Island Nations</u>	
Jamaica	1.23
Dominican Republic	1.20

Cyprus	1.14
Bermuda	1.09
Hong Kong	1.02
Mauritius	0.96
Antigua	0.88
Bahamas	0.79
Fiji	0.72
Cayman Islands	0.65
Iceland	0.64
British Virgin Islands	0.58
Republic of Palau	0.50
Solomon Islands	0.52
Western Samoa	0.39
Larger Regions	
Hawaii	0.90-1.30
Missouri	0.88
Walworth County, WI	0.78
Grand County, CO	0.60
Door County, WI	0.55
Sullivan County, PA	0.44
Southwestern Wyoming	0.39-0.53
Smaller Regions/Cities	
Victoria metro area, Canada	0.50
City of Carlisle, United Kingdom	0.40
Gwynedd, United Kingdom	0.37
Cumbria, United Kingdom	0.35-0.44
East Anglia, United Kingdom	0.34
Isle of Skye, United Kingdom	0.25-0.41
City of Winchester, U.K.	0.19

Source: Fletcher 1989, p. 527; Archer 1982, pp. 240-241)

These examples suggest that the smaller the area, and, by extension, the less developed it is, the smaller the multiplier tends to be. National income multipliers are unlikely to exceed 2.0, and regional ones will always be smaller. Tourism income multipliers are very specific, and a value derived for one area should not be applied to another, even if the areas appear to have similar economies. However, these values can be a good reality check for researchers developing multiplier estimates for other areas.

MULTIPLIER ESTIMATION METHODS

There are three basic techniques available for estimating the secondary and total impact of travel spending. These are the input-output model, the economic base model, and what Archer calls the "ad hoc" model (Archer 1973, p. 44).

INPUT-OUTPUT MODELS

The input-output model, or what the U.S. Department of Commerce calls the "input-output accounts," is a means of analyzing interindustry relationships in the production process in an area's economy (Interindustry Economics Division 1990, p. 41). It permits analysis of the flow of goods and services from one producer to another, and from the final producer to the final buyer, such as consumers. It covers all production, both final and intermediate, and provides a detailed understanding of the linkages among industries that we cannot obtain from analysis of the value of final production sold to final buyers alone (Ritz 1979).

Input-output analysis starts with the development of a direct requirements or transactions table. This table shows the sales in dollars of the total output of an industry to all other industries in the economy and to final demand, usually comprising households (consumption), businesses (investment), government and exports (Fletcher 1989, p. 522). By convention, the rows of the table show the sales of the industry listed at the left, to every other industry and the final demand sectors listed at the top of the columns. By reading down the column, we can see how much input every industry requires from every other industry.

From the transactions table, we develop the direct requirements, or technical coefficients table. Each column in the direct requirements table shows the inputs required by the industry listed at the head from the industries listed at the beginning of each row to produce one dollar of the column-industry's output. Reading down the 1985 U.S. input-output direct requirements table for eating and drinking places, we see that for every dollar of output, these establishments buy 23 cents worth of food and kindred products, five cents of trade services, five cents of business services, and almost four cents of real estate and rental services (Interindustry Economics Division 1990, p. 47). Eating and drinking places buy 15 cents worth per dollar of their own output from each of 46 other industries. They pay 49 cents to their employees and other sources of value added. Each of these values is an input coefficient for the eating and drinking place industry.

By manipulating the direct requirements table through matrix algebra, we obtain the total requirements or inverted technology table, which can be used to obtain indirect output multipliers, and ultimately to estimate total secondary impact (Fletcher and Archer 1991, p. 36).

The total requirements table shows the output required, both directly and indirectly, from each industry and primary input listed in the rows by the industry at the head of the column to deliver a dollar of output to final demand. It summarizes all of the intermediate output required for an industry to produce for retail, including employee consumption effects. Consequently, by summing the coefficients in the columns, we obtain an indirect output multiplier that can be applied to industry sales at producers' prices to obtain the total output required.

As indicated, total primary and secondary output and payroll generated by travel spending is produced through the input-output process. Employment can be added by developing ratios of employment to earnings, as in the Travel Economic Impact Model, for all of the industries with substantial impact. The TEIM approach to estimating direct travel-generated profits and tax revenue can be similarly applied to the total output and payroll estimates to obtain the appropriate multipliers.

Fletcher notes a number of advantages of using input-output models to estimate total economic benefits of tourism compared to alternative methods discussed below (Fletcher 1989, pp. 515-516):

1. provides policy makers with a comprehensive view of an economy;

2. focuses attention on the interindustry linkages in an economy;

3. researchers can customize the model to provide more detail on individual industries;

4. every industry and sector is treated in a uniform manner;

5. allows investigation of individual direct, indirect and induced impacts;

The method has its disadvantages, as well (Fletcher 1989). Archer has discussed the following limitations of input-output multiplier analysis (1977a):

1. input-output assumes linear production functions, that is, any additional final demand will be met by an industry through purchasing inputs in the same proportion from the same suppliers: this may particularly be a problem where the supply of a certain input, such as qualified labor, is limited;

2. all additional income resulting from additions to final demand will be spent in the same proportions on the same consumption items, with the same split between intra-regional purchases and imports: this is analogous to the assumption of a linear production function in (1); while this can be overcome by disaggregating resident purchases in an area, this is quite expensive;

3. interindustry relationships change considerably over a period of perhaps five years, yet most input-output data are older than this;

4. travel spending items may not be consistent with the industry or commodity groups in the input-output tables.

5. most input-output models are static in nature, and do not explicitly recognize time lags that may operate between initial expenditure and full multiplier effects.

All five of these are serious considerations in applying the input-output model to estimating the total impact of travel expenditures in an area. However, it should be noted that the first two limit the usefulness of the ad hoc and economic base models as well. Fletcher and Archer present ways of dealing with the input-output model drawbacks. (1991, pp. 41-43)

ECONOMIC BASE MODELS

Once commonly used to estimate regional impact multipliers, the economic base approach divides the local economy into two sectors: (1) firms serving markets outside the

region; and (2) firms serving markets within the region (Archer 1977a, p. 14-16; Tiebout 1962; Krikelas 1992).

The goods and services firms sell outside area boundaries are considered exports and are assumed to be the prime mover of the local economy. If sales and employment serving this export market rise, sales and employment of firms serving the regional market is presumed to grow as well, stimulated by the injection of "new" spending. For example, the more a hotel can sell to non-resident visitors, the greater the employment of residents and the more money will be spent by these employees and by the hotel operator in the local economy.

This approach recognizes that industries and firms within industries may sell their products in both regional and extra-regional (export) markets. For each industry in the area, output, payroll or employment is divided between basic (export) and non-basic (local) markets. Ratios are then developed of total employment or earnings in a region to basic employment or earnings to estimate the multiplier.

To develop these multipliers, data from sources such as the U.S. Census Bureau's censuses of business are used to divide sales, employment and payroll between basic and non-basic markets by industry sector in an area (Bureau of the Census 1989, 1990). The amounts allocated to basic markets are summed and used as the denominator, with the total for the magnitude (output, employment or earnings) in the area as the numerator. The resulting multiplier is then applied to the direct tourism expenditures in the area to obtain the total of primary and secondary impact.

The advantage of this approach is that it is simple and straightforward, employing data generally available even for small areas such as counties. Its disadvantages include the often subjective nature of allocating industry activity between basic and non-basic markets, the assumption that all types of export sales to basic markets have the same multiplier effect regardless of their industry source, and the assumption that the growth in an area economy is attributable primarily or totally to export sales. Other variables that affect regional growth and not explicitly recognized in the economic base model include inter-regional capital flows, technological changes, demographic shifts, and state/local tax law changes. (Krikelas 1991, p. 18)

For these reasons, base theory multipliers are seldom found in tourism impact studies today, reflecting the conclusion that ":the findings on economic base models are conclusive. . . . The literature would need to be much more convincing than it has been hitherto for a disinterested observer to resist the conclusion that economic base models should be buried, and without prospects for resurrection." (Richardson 1985, quoted in Krikelas 1992, p. 17)

THE AD HOC MODEL

Archer and Owen (1972) first adapted the Keynesian multiplier model to estimating the total impact of tourism expenditures in an area. They termed their adaptation, *ad hoc* models, because they are developed individually for each area studied.

The *ad hoc* model concentrates on the income generated in an area from the initial travel expenditure through the consumption patterns of its residents. The simple *ad hoc* model is (Fletcher and Archer 1991, p. 40):

$$AHM = \frac{A}{1 - BC} \qquad (14)$$

where
AHM = value of the *ad hoc* multiplier
A = proportion of tourism expenditure remaining in the economy after first-round leakages
B = proportion of residents' income spent in the area economy
C = proportion of expenditure by residents that accrues as income in the area economy.

The more developed form actually used for individual areas is (*ibid*.):

$$AHM_{i,j} = \frac{\sum_j \sum_i Q_j K_{i,j} V_i}{1 - c \sum_i X_i Z_i V_i} \qquad (15)$$

where
AHM = value of the *ad hoc* multiplier
j = types of travelers
i = types of business establishment directly serving travelers
Q = proportion of total tourist expenditure spent by each type of tourist
K = proportion of total tourist expenditure spent in each type of business establishment
V = direct and indirect income generated per dollar spent by each type of business
c = residents' marginal propensity to consume
X = proportion of total residents' consumption expenditures in each type of business
Z = proportion of X which is spent within the study area

The ad hoc model traces the impact of expenditures of different types of travelers (eg., business, leisure) in different types of tourism-related business establishments (eg., hotels, restaurants) through the direct and indirect income generated by each. The sum of these incomes for each type of business is divided by a measure of leakage that takes into account the marginal propensity to spend this income on consumption in the study area.

The ad hoc model requires a substantial amount of data to be collected through surveys. For example, in addition to estimates of income generated per dollar of travel expenditure for each type of travel-related business (Y), the distribution of resident consumer spending among types of businesses (X) must be developed, as well as the proportion of income spent in the area by residents (Z). Moreover, additional structures need to be specified to develop the other types of multipliers, such as employment and income multipliers.

Finally, it is not clear from the literature how the indirect income generated by expenditures in each type of business for (V) is estimated. This can be a formidable task. Liu (1986) solved this problem by employing estimates of direct and indirect income from an input-output matrix. But if the researcher has access to an adequate input-output model, why ignore it in favor of following the ad hoc model approach?

On the other hand, the ad hoc multiplier appears suitable for areas where building individual input-output models is too expensive or impractical.

Given the inherent flaws in the base theory model, the researcher's choice is between the *ad hoc* model and the input-output approach, depending on the budget available and the expertise of the researchers. Fletcher and Archer maintain that the advantages of the input-output model are "overwhelming" from an analytical standpoint (1991, p. 44). The major drawback is the extensive data collection requirements. Recent developments, however, have all but eliminated this disadvantage in the U.S. and Canada.

Many state and provincial (Canada) economic development agencies and state universities have developed input-output tables for individual areas (*eg.,* Burd 1991). Moreover, the appropriate tables are available at the national, regional, and local levels for most areas on a periodic basis through the U.S. Department of Commerce's RIMS II regional input-output modeling system (U.S. Bureau of Economic Analysis 1984). And the U.S. Department of Agriculture IMPLAN system can be used to develop input-output estimates for individual cities and counties in the U.S. (Turco and Kelsey 1992, p. 64) Given the relatively modest cost of accessing these models, they can provide a cost-effective way to develop measures of total tourism impact on an area's economy

OTHER ISSUES

The discussion above has been limited to the economic benefits of tourism spending to the area visited. Bull reminds us that the generating area may well benefit from outbound travel, too (1992, p. 136):

> Very few researchers have attempted to analyze the value, if any, of tourism to generating economies. . . . However, *mass tourism generation* , at least, is likely to produce:
>
> - employment in travel agencies, tour operators, transport undertakings and enterprises engaged in marketing destinations;
>
> - investment by carriers and tour operators, and the possibility of developing multinational tourism enterprises;
>
> - a possible fall in seasonal price levels whilst tourists are away and demand is slacker;

- increases in short-term saving as people "put by" for trips, or businesses hold prepayments on money markets;

- a source of taxation revenue on those items purchased before or on departure.

We can add to this the business receipts, income and employment produced by purchases in anticipation of the trip, from golf balls to a yacht. Through additional questions added to the National Travel Survey, the TEIM could include several of these impacts. Other models might as well. However, there appears to be little interest in this impact at this time.

There is no discussion here of non-monetary benefits that can accrue to an area as a result of tourists. Tourist demand may stimulate ethnic price and encourage preservation of cultural heritage, and aid preservation of local arts and crafts (Long 1991, pp. 205-206). The quality of health care may also rise as tourism develops (Perdue *et al. 1991, p. 196).* These are enhancements to residents' quality of life that have value but are difficult to quantify. The researcher seeking a full disclosure of tourism's benefits in an area would do well to at least enumerate such positive effects to supplement the monetary ones.

CONCLUSION

If there were any doubts about the importance of measuring tourism's economic impact, the myriad of studies available on the topic should remove them. But there have been too many divergent techniques employed owing more to the imagination of the designer than to the reality they attempt to measure. Reading descriptions of them reminds this author of a recent commentary on the field of risk analysis:

> Risk analysis begins with scientific studies, usually performed by academics or government agencies, and sometimes incomplete or disputed. The data from the studies are then run through computer models of bewildering complexity, which produce results of implausible precision. (Davis 1992)

But perhaps some useful conclusions can be drawn from comparing and contrasting efforts so far.

1. Tourism contributes significantly to the economy of virtually any geographic area where people live or work.

2. It is impossible to distinguish all of tourism's contributions by observation alone or solely by use of secondary data.

3. Expert judgment is no substitute for sound, objective research techniques in deriving quantitative estimates.

4. Recall bias significantly affects measures of trips and expenditures, and this bias grows with the length of the recall period;

5. Recall decay is a substantially greater problem in estimating expenditures than in determining measures of real travel activity, such as trips and nights away from home.

6. There are few independent secondary measures that can be used to judge the accuracy of a given tourism impact model.

7. Tourism multiplier analyses based on input-output models are superior to those dependent on other techniques of measuring total economic impact of tourism in an area.

Two consequences result from these conclusions:

A. In order to evaluate a given model, considerable efforts must be directed toward examining its structure, that is, its assumptions, relationships, and output, and its input data; this means carefully applying the criteria for model evaluation presented in Chapter (one before this) and employed in this chapter.

B. Application of several different models to estimating impact in a given area and at a given time would contribute considerably to our assessment of this impact and of the accuracy of individual models.

Point B commends the use of "convergent validity" in estimating impact and evaluating alternative models (Easterby-Smith *et al*. 1991, p. 121; WTO 1988, p. 206). If two or more ways of measuring a phenomenon agree, than there is a high likelihood that this measurement is accurate. Occasionally we find such comparisons in the literature (*eg*., Runyan 1988), but they are often plagued by different definitions and scopes, preventing a true appraisal. More research involving parallel estimates of economic impact could be quite rewarding.

Additional research is also required on the size and variability of respondent recall decay, especially with regard to travel expenditures. The publication of now-hidden structures of tourism impact models would also add considerably to our understanding of the economic effects of tourism and their measurement.

Most studies of the economic contribution of tourism to date have focused on measuring its volume and on simple analyses of its relative size. We need to extend this analysis to larger issues faced by public agencies. For example, Kottke has suggested using linear programming models to assess the land, labor and capital consequences of expanding tourism demand in an area (1988). And more research on the varying economic contributions of different types of tourists would be quite productive (Frechtling 1992; Fletcher 1989, p. 518; Moisey and McCool 1990; Tyrrell 1989; Liu 1986; Tatzin 1978). Expanding tourism satellite accounts beyond their input-output model linkages offers great promise here. Such studies could better guide public agencies in the allocation of scarce marketing funds in order to maximize returns to their constituent communities.

In short, it is time for tourism researchers to progress beyond measurement issues and begin to draw conclusions that can be applied broadly to public marketing, planning, and

development decision-making. This can help ensure world tourism continues to grow on terms congenial to residents, tourists, and the environment.

Table 3: Expenditure Categories and Related Types of Business included in the Travel Economic Impact Model

Expenditure category	Types of Business (SIC code*)
Transportation	
1. Air	Air transportation (45)
2. Taxicab/limousine	Local and suburban passenger transportation and taxicab companies (411+412)
3. Auto/truck/RV operation	Gasoline service stations (554)
4. Auto/truck/RV fixed costs	Automotive dealers (55 except 554 and 555)
5. Auto rental	Passenger car and recreational vehicle rental (7514+7519)
6. Bus/motorcoach service, except local (413+4142)	Intercity and rural bus transportation and bus charter
7. Rail	Amtrak
8. Cruise ship	**
Lodging	
9. Hotels/motels, etc.	Hotels and motels (701)
10. Rented vacation homes	Hotels and motels (701)
11. Camper/trailer	Recreational vehicle parks and campsites (703)
12. Own second home	Building materials, hardware, garden supply and mobile home dealers (52)
Food	
13. Prepared meals	Eating and drinking places (58)
14. Unprepared food	Grocery stores (54)
Entertainment/recreation	
15. Theme, amusement parks	Amusement and recreation services (79)
16. Snow skiing	Amusement and recreation services (79)
17. Casino gaming	Amusement and recreation services (79)
18. Other entertainment/recreation	Amusement and recreation services (79)
Other	
19. Incidental purchases	General merchandise and miscellaneous retail stores (53+59)
20.***	Arrangement of passenger transportation (472)

*Standard Industrial Classification codes, as established by the U.S. Office of Management and Budget, 1987.

**The impact of this spending in the average state is included in arrangement of passenger transportation (472).

***No separate expenditures are identified with this category, since these establishments act as agents for air transportation, cruise ship transportation, hotel/motel lodging, and other types of businesses already listed.

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Assessing the impacts of travel and tourism: Measuring economic benefits. In J. R. Brent Ritchie & C. R. Goeldner (Eds.), Travel, tourism, and hospitality research (2nd ed., pp. 367â€“391). New York: John Wiley & Sons. Internet Source: Organization for Economic Cooperation and Development. (2009). The impact of culture on tourism.Â Event Management is governed by an international editorial board consisting of experts in event management, tourism, business, sport, and related fields. This board conducts most of the manuscript reviews and plays a large role in setting the standards for research and publication in the field. The Editor-in-Chief receives and process all manuscripts, and from time to time will modify the editorial board, ensuring a continuous improvement in quality. Economic Benefits. Helps diversify and stabilize the local economy. Provides governments with extra tax revenues each year through accommodation and restaurant taxes, airport taxes, sales taxes, park entrance fees, employee income tax etc.. Creates local jobs and business opportunities. These include those jobs directly related to tourism (hotel and tour services) and those that indirectly support tourism (such as food production and housing construction). The multiplier effect: Brings new money into the economy.Â Tourism follows a "product life cycle", with a final stage of decline, where the destination no longer offers new attractions for the tourist, and the quality has diminished with the rise of competition and tourist saturation. Tourism life cycle model.