Estimating the Multiplier Effects of Tourism Expenditures on a Local Economy through a Regional Input-Output Model

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Tourism multipliers indicate the total increase in output, labor earnings, and employment through interindustry linkages in a region as a result of tourism expenditures. The RIMS II regional input-output model was employed to estimate the multiplier effects of visitor expenditures in Washington, D.C. Both normal multipliers and ratio multipliers are analyzed, and the latter is found to be a more reliable indicator of total impact on earnings and employment in the city. A comparison of the multipliers for 37 industry sectors and the tourism multiplier in the city finds that the latter ranks relatively high for earnings and employment, but low for output.

Tourism, “the activities of persons traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes” (UN/WTO 1994, p. 5), can generate sales and output, labor earnings, and employment in a nation, or in a province, state, department, municipality, or other local area within a nation. These economic contributions are of interest to private businesses, public agencies, and individuals living in areas that tourists visit. Informed private decision making and public policy require that executives, officials, employees, and their dependents understand the contribution that visitors make to the local economy, both through those businesses directly serving visitors and those that supply these businesses.

A great deal has been published about the contributions of tourism to national, regional, and local economies (e.g., Bull 1991; Fletcher 1994; Frechtling 1994; Lundberg, Stavenga, and Krishnamoorthy 1995; U.S. Travel Data Center 1996; World Travel and Tourism Council 1996). Most of these studies include estimates of what tourists or visitors to an area spend while there, which generates economic activity directly in the form of output or sales, labor earnings, and employment.

Many of these studies have presented estimates of the so-called multiplier impact of tourism expenditures: the total sales, output, or other measure of economic benefits generated once the initial visitor spending has worked its way through the economy under study through interindustry transactions (the “indirect impact”) and through employee consumption expenditures (the “induced impact”). A significant number of these studies employ input-output models to explore these total economic effects. However, a common complaint about such models is that they are expensive to develop at the regional level given their extensive data requirements (e.g., Fletcher 1994, p. 478; Frechtling 1994, pp. 386-87).

The purpose of this study is to explore the estimation of the total contributions to a local economy attributable to visitor spending through the use of a regional input-output model that can produce multiplier estimates for any single county or multicounty region of the United States. Pursuant to this, the study examines several types of economic multipliers useful to tourism analysis, each of which can be used to estimate output, earnings, and employment attributable to visitor spending in a local area.

This study extends the work of Mak (1989), which applied a set of statewide multipliers derived from the Regional Input-Output Modeling System (RIMS II) operated by the U.S. Department of Commerce to 1983 estimates of tourism expenditures in each of the 50 states and the District of Columbia. This article is further informed by the authors’ review of more than 100 studies of the economic impact at national, regional, and local levels published in English.

The next section identifies the objectives and scope of this study. The following section presents the methodology and the data required to apply the RIMS II multipliers to a given region. The fourth section applies the RIMS II multipliers to the city of Washington, D.C., and analyzes the results. The final section of this article provides conclusions and recommendations.

SCOPE OF THE STUDY

Specifically, this study discusses

- how the regional input-output system of the U.S. Department of Commerce can be used to estimate the di-
rect, indirect, and induced impacts of tourism expenditures on sales or output, earnings, and employment in a local economy;

• a comparison of the validity of normal or final-demand multipliers to ratio or direct-effect multipliers in estimating such local impacts; and

• a comparison of the tourism multiplier for an area to multipliers for other sources of economic activity.

This study is limited to the contributions of visitor expenditures in a region (also referred to as “tourism expenditures”) to the output, earnings, and employment in that region. A wider scope of analysis could encompass the social, cultural, and environmental impacts of such visitors. Additional research could also identify the costs to the jurisdiction of hosting visitors, which could be compared to the jurisdiction’s revenues visitors generate through taxes and fees to yield a measure of net economic benefits. Finally, the input-output technique has some serious conceptual and operational drawbacks when applied to estimating the total economic contribution of visitor spending (Briassoulis 1991; Fletcher 1994; Frechtling 1994; Hughes 1994), yet this study does not attempt to correct these.

METHODOLOGY

The impact of tourism on the Washington, D.C., economy in 1994 serves as a case to demonstrate the use of a particular regional input-output model available for all areas of the United States. Traditionally, two sets of data are required to carry out an input-output analysis to demonstrate the impact of tourism expenditures on output, earnings, and employment in a region such as the city of Washington, D.C. (e.g., Fletcher 1994, p. 476). The first is a measure of final visitor demand in the region broken down into product or industry categories, and the second is a set of multipliers corresponding to those expenditure categories. The RIMS II system can accommodate the final visitor demand estimates, but, as will be discussed below, there is an advantage to using the earnings directly generated by the visitor spending in each category to develop multiplier estimates.

Tourism’s economic impact on a region is initiated by tourism expenditures, “the total consumption expenditure made by a visitor on behalf of a visitor for and during his/her trip and stay at destination” (UN/WTO 1994, p. 21). Consequently, the first data set required is a breakdown of visitor expenditures by category (e.g., local transportation, food, lodging), from visitor surveys or other sources indicating how much visitors spend on transportation, accommodation, food, and other goods and services in the local economy. The second data set required comprises appropriate multipliers for estimating total output, earnings, and employment generated by the tourism expenditures.

This study employs multipliers derived from the RIMS II regional input-output model operated by the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce (U.S. Bureau of Economic Analysis 1997; hereafter BEA 1997). Figure 1 details the process of using RIMS II multipliers to provide total impact estimates in a U.S. region and comprises the steps followed in this study.

For this study, estimates of visitor expenditures and the earnings and employment they directly generated in Washington, D.C., were obtained through special tabulations of the U.S. Travel Data Center’s Travel Economic Impact Model (TEIM) for 1994 for 15 categories. Initially developed in 1975 for the U.S. Department of Interior, the TEIM has been the primary source for estimates of U.S. resident spending on trips away from home and the business receipts, payroll income, employment, and tax revenue they generate for each of the 50 states and the District of Columbia for two decades (U.S. Travel Data Center 1996). The TEIM embodies the following definition of tourism expenditure: spending by U.S. residents on trips to places 100 miles away from home and trips including one or more nights in paid accommodations (U.S. Travel Data Center 1996, p. 42). Specifically, the estimates exclude foreign visitor spending in the United States, which probably causes them to underestimate total visitor expenditures in Washington, D.C., and the resulting multiplier effects significantly.

Of the 14 TEIM expenditure categories, expenditures on air transportation, bus transportation, rail transportation, and boat transportation, and fixed auto expenses were excluded since they relate predominantly to outbound tourism or are likely to be made in a visitor’s residence area rather than in Washington, D.C. No expenditures appeared in the categories of campground lodging or second home lodging in the city.

The seven remaining TEIM expenditure categories were coded into the six RIMS II industry categories most closely related to them, as indicated in Table 1. A total value of nearly $2.4 billion in goods and services was delivered to U.S. visitors to Washington, D.C., in 1994. The largest part of these expenditures occurred in the eating-and-drinking-place industry, while nearly as much was received by the local economy; and nearly $2.4 billion in goods and services was delivered to U.S. residents on trips to places 100 miles away from home and trips including one or more nights in paid accommodations (U.S. Travel Data Center 1996, p. 42). Specifically, the estimates exclude foreign visitor spending in the United States, which probably causes them to underestimate total visitor expenditures in Washington, D.C., and the resulting multiplier effects significantly.

FIGURE 1
STEPS FOR ESTIMATING THE TOTAL IMPACT OF TOURISM EXPENDITURES IN A LOCAL ECONOMY USING RIMS II MULTIPLIERS

1. Obtain visitor expenditures in the economy under study by category of item purchased and/or earnings generated by such expenditures and/or employment generated by such expenditures.

2. Match the expenditure, earnings, and/or employment categories with the RIMS II industries.

3. For retail trade industries, transform visitor expenditures into visitor output through estimates of trade margins; for service industries, visitor expenditures equal visitor output.

4. Obtain the appropriate RIMS II output, earnings, and employment multipliers for these industries from the Bureau of Economic Analysis.

5. Multiply the visitor output for each industry by the appropriate final-demand multipliers to obtain total output, earnings, and employment produced in the economy by the tourism expenditures, and evaluate.

6. If final-demand multipliers for earnings and/or employment seem unreasonable, multiply earnings and/or employment directly generated by these expenditures by the appropriate direct-effect multipliers to obtain total earnings and employment produced by tourism expenditures. Evaluate these multipliers.

7. Attempt to validate these estimates by comparing them with similar estimates obtained from other acceptable sources.
The relationship between visitor expenditures at purchasers’ prices and RIMS II output for transportation and service industries is one to one. That is, visitor expenditures equal output attributable to visitors for the local and suburban transportation, automotive rental and leasing, hotels and lodging, eating and drinking places, and the other amusement and recreation services industries category in Table 1. However, for the retail trade sector, which here supplies gasoline purchases and shopping in the city, output generated by visitor expenditures is limited to the trade margins for the products purchased, that is, the difference between the “price the retailer charges the consumer and the cost to the retailer” (BEA 1997, p. 9). This margin includes labor earnings, sales and excise taxes, profits, and certain other expenses.

The BEA retail trade margins applicable to RIMS II analysis are related to products consumers purchase rather than the industries from which they purchase them. For Washington, D.C., visitors, the TEIM indicated what was spent on gasoline and on “shopping” without any further enumeration. For this study, the authors composed a list of representative products that visitors purchase and obtained the retail trade margins from BEA, as indicated in Table 2. Objective research on the goods visitors purchase would refine this list and perhaps change the margin estimates significantly.

The retail trade margin for each product is expressed as a percentage of the purchaser value, or the total retail sales to purchasers in 1994 for the overall United States. Visitor expenditures on distilled and blended liquors, for example, are multiplied by the value in column 2 of Table 2 to determine the retail output associated with this expenditure.

If the retail stores selling goods to Washington, D.C., visitors purchase from wholesalers located in the city, then additional output is created for the wholesale trade industry. If, however, D.C. retailers purchase from wholesalers outside the city, then there is no local output produced from the wholesale trade industry. Since we do not know where the relevant wholesalers are located, we assumed that one-half of the retail store purchases from wholesalers occurred outside the city, while one-half occurred within the city, and we cut the wholesaler margins in half for each product to reflect this assumption, producing the adjusted wholesale trade margins in column 3 of Table 2. So multiplying visitor spending on distilled and blended liquors by the gross margin shown in column 4 of Table 2 produces an estimate of the visitor output associated with retail and wholesale trade activity in the city. Owing to a severe lack of information, no margins were added for transportation costs of delivering the goods to the retail stores selling to visitors. Furthermore, it was assumed that none of the goods that visitors purchased from Washington, D.C., retailers were produced within the city. Both of these assumptions may add a significant downward bias to the gross trade margins estimated and consequently depress the estimates of total output produced by visitor expenditures below their actual values.

The values in row F of Table 2 are the weighted means of the five product category retail, wholesale, and gross trade margins. The resulting combined gross trade margin in row F, column 4 was used to represent the gross trade margin for visitor shopping expenditure in Washington, D.C. Since visitor expenditures for gasoline for both owned and rental vehicles in the city are estimated separately in the TEIM, the gross trade margin in row G, column 4 was used to determine visitor output for these purchases.

The second edition of the BEA’s Regional Industrial Multiplier System, commonly called “RIMS II” was accessed to obtain multipliers appropriate to measuring the total economic impact of tourism in Washington, D.C., for 1994. The following section outlines the process used to produce these multipliers.

### RIMS II Methodology

The BEA developed a method for estimating regional input-output multipliers in the 1970s and updated its estimates in early 1997 (BEA 1997). The present study employs BEA’s 1994 RIMS II multiplier estimates for 471 detailed industries and private households, the latter considered “both suppliers of labor inputs to regional industries and purchasers of regional output” (BEA 1997, p. 21).

RIMS II multipliers are developed in three steps (ibid.). First, a national industry-by-industry direct requirements table is prepared from the make and use tables of the BEA’s 1987 benchmark input-output accounts for the U.S. economy. This table indicates the amount of output required from each industry (in the table’s rows) for each industry (in the columns) to produce a dollar’s worth of output for the United States in a year’s time. Since households are included, the RIMS II multipliers are Type II multipliers in tourism...
research parlance since they include the indirect and induced effects of visitor spending in the region (Fletcher 1994, p. 477).

As part of this process, household earnings, including wages and salaries, proprietors’ income, directors’ fees, and employer contributions to health insurance less personal contributions for social insurance, are produced (BEA 1997, p. 22). These estimates are used to develop the earnings and employment multipliers.

The second step in the RIMS II approach to multiplier estimation is to prepare a regional direct requirements table. Given a region for study, such as the District of Columbia, “location quotients” are used to produce regional interindustry requirements from the national table (BEA 1997, pp. 22-23). The location quotient for a row industry indicates to what extent the study region’s supply of an industry’s output is sufficient to meet regional demand and is computed as the ratio of the industry’s share of regional wages and salaries to that industry’s share of national wages and salaries. Consequently, a location quotient for a row industry greater than or equal to 1 indicates that all regional industries’ demands for the output of the row industry are met entirely from intraregional production.

On the other hand, if the location quotient for a row industry is less than 1, this suggests that the industry’s output is not sufficient to supply intraregional industries’ needs and a portion of these needs must be satisfied from imports from outside the region. Such imports (often called “leakages”) reduce the output produced within the region and thus reduce the size of the multipliers associated with that industry. Such quotients are multiplied by the adjusted national direct requirements table to produce the regional direct requirements table.

The final adjustment to the national tables needed to produce the regional direct requirements table is to revise the household row entries based on the proportion of total workers in the region who commute from outside of it. This is to avoid overestimating the purchases in the region by those employed within it.

As the third and final step in producing the regional multipliers desired, the regional direct requirements table must be transformed by matrix inversion to produce the total requirements table for the region, for this table supplies the multiplier estimates for output in the region for each industry. Final-demand multipliers are based on the change in final demand produced by an activity such as tourism spending in the region and equals the output multiplier for an industry multiplied by the household-row entry in the direct requirements table. Final-demand employment multipliers are derived by multiplying the final-demand earnings multiplier for an industry by the ratio of jobs to earnings for the industry. This number represents the portion of a job in an industry related to one dollar of earnings for that job and is quite small, so by convention it is expressed as jobs per $1 million in earnings.

The final-demand earnings and employment multipliers, also called “normal” multipliers, should be distinguished from “ratio” or “direct-effect” multipliers for individual industries (Frechtling 1994, p. 383). The former compose the ratio of the total earnings or employment to final demand, in this case, tourism expenditures in the region. The direct-effect earnings multiplier indicates the ratio of total earnings generated by the change in final demand to the earnings directly generated. So if a RIMS II industry showed a direct-effects earnings multiplier of 1.4, then total earnings produced by indirect and induced effects are 1.4 times the earnings directly generated by the industry in the area. Similarly, the direct-effect employment multiplier is the ratio of total employment in terms of jobs generated to the number of jobs directly generated by the change in final demand (BEA 1997, p. 23).

The final-demand multipliers are useful for certain policy analyses because they indicate how much in total earnings can be generated by a given increase in tourism spending. For example, jurisdictions can use such multipliers to determine the total “bang for the buck” to be derived from stimulating an additional $1 million in tourism spending in the area through marketing programs. However, the BEA indicates that the way RIMS II is estimated, the direct-effect multipliers reflect regional relationships between final demand or output, on one hand, and earnings and employment, on the other (BEA 1997, p. 5). Consequently, “If the regional relationships differ from the national relationships, the two sets of estimates will differ and the estimates based on the direct-effect multipliers are preferable” (BEA 1997, p. 5).

RESULTS

Table 3 shows the RIMS II final-demand multipliers for each of the industries associated with visitor spending in Washington, D.C., in 1994 as obtained from the BEA table of 471 industries for the jurisdiction.
Multiplying a category of visitor expenditures (Table 1, column 4) by the gross trade margin as defined above (if the expenditure is on a retail good; see Table 2) and then by the appropriate RIMS II final-demand multiplier (Table 3, column 3, 4, or 5) produces an estimate of total output, earnings, or employment, respectively, generated in Washington, D.C., shown in Table 4.

Earnings multipliers for the tourism-related industries in Table 3 can be compared with those found in our review of studies employing tourism multiplier methodologies for U.S. localities as shown in Table 5. Such a comparison suggests the RIMS II final-demand earnings multiplier for Washington, D.C., is low. This is confirmed by comparing the total earnings generated by this process ($365.8 million in Table 4, column 5) to the U.S. Travel Data Center’s estimate of earnings directly attributable to these expenditures ($594.6 million in Table 6, column 2). Similarly, the total employment estimates from the RIMS II final-demand multipliers appear low. The Table 4 estimate of 19,504 jobs (column 6) produced by direct, indirect, and induced impacts of these visitor expenditures is about half of the Data Center’s estimate of employment directly generated of 33,535 jobs.

Moreover, the RIMS II total employment estimate also seems low compared to the 15,114 jobs in the city’s hotel/motel industry and 26,562 jobs in eating and drinking places alone documented by the U.S. Department of Labor’s ES202 tabulations for Washington, D.C. (Evans 1998). These comparisons raise questions about the validity of the RIMS II final-demand earnings and employment multipliers for tourism for Washington, D.C.

As indicated above, the BEA agrees that the final-demand multipliers may not be as representative of an area as the direct-effect multipliers since the former are based on national relationships of output to earnings and employment rather than reflecting these relationships in the region under study. The TEIM estimates of earnings and employment are based on the relationships of tourism expenditures to earnings and employment for the various tourism-related industries in Washington, D.C., not the nation as a whole. Consequently, the TEIM estimates of the earnings and employment directly attributable to tourism spending can be expected to be more accurate than the RIMS II relationships incorporated in its final-demand multipliers.

Table 6 presents the U.S. Travel Data Center’s TEIM estimates of earnings and employment directly generated by tourism expenditures in the five relevant RIMS II industries (columns 2 and 3). Columns 4 and 5 present the RIMS II direct-effect multipliers for earnings and employment, respectively. Finally, columns 6 and 7 present the products of the TEIM direct estimates and the RIMS II multipliers. For example, to obtain the direct-effect multiplier estimate of total earnings associated with visitor spending on hotel

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**TABLE 3**

FINAL-DEMAND TOURISM MULTIPLIERS FOR VISITOR INDUSTRIES IN WASHINGTON, D.C., 1994

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<tr>
<td>65.0200</td>
<td>Local and suburban transit and interurban highway passenger transportation</td>
<td>1.2453</td>
<td>0.2374</td>
<td>16.9</td>
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<td>69.0200</td>
<td>Retail trade except eating and drinking</td>
<td>1.3523</td>
<td>0.2018</td>
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<tr>
<td>75.0001</td>
<td>Automotive rental and leasing without drivers</td>
<td>1.3464</td>
<td>0.0956</td>
<td>3.6</td>
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<tr>
<td>72.0100</td>
<td>Hotels and lodging places</td>
<td>1.3801</td>
<td>0.1837</td>
<td>7.2</td>
</tr>
<tr>
<td>74.0000</td>
<td>Eating and drinking places</td>
<td>1.2501</td>
<td>0.1471</td>
<td>9.8</td>
</tr>
<tr>
<td>76.0206</td>
<td>Other amusement and recreation services</td>
<td>1.3993</td>
<td>0.1863</td>
<td>12.4</td>
</tr>
</tbody>
</table>

Source: RIMS II tables obtained by the authors from the U.S. Bureau of Economic Analysis (1997).

\(^a\) Number of jobs per $1 million of output delivered to final demand by the row industry.

**TABLE 4**

ESTIMATES OF TOTAL OUTPUT, EARNINGS, AND EMPLOYMENT GENERATED BY VISITOR EXPENDITURES IN RELATED INDUSTRIES BASED ON RIMS II FINAL-DEMAND MULTIPLIERS FOR WASHINGTON, D.C., 1994

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<tbody>
<tr>
<td>65.0200</td>
<td>Local and suburban transit and interurban highway passenger transportation</td>
<td>34.1</td>
<td>42.4</td>
<td>8.1</td>
<td>576</td>
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<tr>
<td>69.0200</td>
<td>Retail trade except eating and drinking</td>
<td>146.0</td>
<td>197.4</td>
<td>29.5</td>
<td>1,547</td>
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<tr>
<td>75.0001</td>
<td>Automotive rental and leasing without drivers</td>
<td>95.8</td>
<td>129.0</td>
<td>9.2</td>
<td>345</td>
</tr>
<tr>
<td>72.0100</td>
<td>Hotels and lodging places</td>
<td>719.3</td>
<td>992.7</td>
<td>132.1</td>
<td>5,179</td>
</tr>
<tr>
<td>74.0000</td>
<td>Eating and drinking places</td>
<td>958.1</td>
<td>1,197.7</td>
<td>140.9</td>
<td>9,389</td>
</tr>
<tr>
<td>76.0206</td>
<td>Other amusement and recreation services</td>
<td>199.0</td>
<td>278.4</td>
<td>37.1</td>
<td>2,467</td>
</tr>
<tr>
<td>Total</td>
<td>$2,152.2</td>
<td>$2,837.7</td>
<td>$365.8</td>
<td>19,504</td>
<td></td>
</tr>
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</table>

Sources: U.S. Travel Data Center (1996) and authors’ calculations from U.S. Bureau of Economic Analysis RIMS II tables (1997).

Note: Details may not add to totals because of rounding.
lodging in Washington, D.C., we multiply the earnings directly generated in row D, column 2 ($230.2 million) by the direct-effect earnings multiplier in row D, column 4 (1.3067) to obtain the direct-effect multiplier earnings in row D, column 6 ($300.9 million). (The products and totals in Table 6 may not exactly match independent multiplication and addition of them due to the rounded estimates shown in the table.)

Overall, Table 6 indicates that more than $748 million in earnings in Washington, D.C., businesses were generated by tourism spending for over 38,000 jobs (row F, columns 6 and 7). This compares to the RIMS II final-demand multiplier estimates of $365.8 million in earnings and 19,504 jobs. The figures in row F of columns 4 and 5 are the implicit direct-effect multipliers for total visitor expenditures in Washington, D.C., reflecting the average of the individual industry multipliers weighted by visitor expenditures.

Direct-effect multipliers cannot be compared to the earnings multipliers shown in Table 5 for comparable U.S. localities because these latter are normal or final-demand multipliers. However, they can be transformed into implicit final-demand multipliers by simply dividing the total earnings or employment derived from the direct-effect multipliers (Table 6, row F, column 6 or 7) by the original visitor expenditures (Table 1, column 4) in an industry. The implicit final-demand earnings and employment multiplier estimates for total visitor expenditures in Washington, D.C., in 1994 derived by this method are summarized in Table 7.

Comparing the implicit final-demand output and earnings multipliers in Table 7 with those available for other U.S. localities in Table 5 indicates Washington, D.C., falls at the bottom. This is not surprising, given that the city is only 68 square miles (177 sq. km.) in area and the center of a large, economically integrated metropolitan area with 9 times the population of the city alone. However, we should make such comparisons cautiously, since the multipliers for the localities listed in Table 5 may include different assumptions (e.g., whether households are in or not), be generated by different methodologies (e.g., ad-hoc multipliers as discussed in Fletcher [1994]), and/or reflect different distributions of expenditures across expenditure categories (e.g., more on hotels, less on shopping).

Cross-Industry Comparisons

The overall output, earnings, and employment multipliers associated with total visitor spending in Washington, D.C., are composites. They reflect visitor expenditures in seven categories and multipliers in six industry categories. This provides overall output, earnings, and employment multipliers for a synthetic tourism sector. BEA publishes such multipliers for 37 different “industry aggregations.” Each of these 37 are composed of a set of detailed industries from the table of 471 detailed industries. Such industry aggregations seem comparable in concept to the tourism sector as discussed herein, and comparisons among them can suggest how the tourism sector ranks among recognized industry sectors in the city in its linkages to the city economy.

Table 8 shows the ranking of the top 10 detailed industries in Washington, D.C., in terms of output, earnings, and employment multipliers derived from the BEA table for 1994. The explicit final-demand earnings and employment multipliers are shown for tourism to be comparable to the detailed industry data available from the RIMS II table.

The tourism final-demand earnings and employment multipliers combine the direct effects and secondary effects of visitor spending on local earnings and employment. The ratio or direct-effect earnings and employment multipliers, on the other hand, are measures of the interindustry linkages and employee spending in the area excluding the direct impacts. Consequently, the relative sizes of the direct-effect multipliers better indicate the extent of industry and employee linkages within the local economy than do the final demand multipliers. The larger the direct-effect multipliers, the more visitor spending cycles within the local economy producing income and jobs before it leaks out (Archer and Fletcher 1990, p. 14).

A comparison of the RIMS II direct-effect earnings and employment multipliers for visitor spending with those for the 37 industry aggregations finds tourism ranks rather high. The tourism final-demand earnings multiplier (0.166) ranks 10th out of 38 aggregate industries, while the direct-effect employment multiplier for visitor spending (9.06 jobs per $1 million in final demand) ranks 5th. This indicates that the linkages of the composite visitor serving sector to other industries in the city are strong compared to other industry aggregations in Washington, D.C. This may reflect the fact that the primary visitor businesses tend to purchase their supplies and labor from within the city, or the primary tourism employees tend to make their purchases from businesses located in the city, or a combination of the two.

However, the tourism output multiplier ranks only 20th out of the 38 industry aggregations. One reason is that nearly one-fifth of visitor spending is on retail goods where the direct output generated is limited to the retail and wholesale trade margins. The top 10 industries in Washington, D.C., in terms of RIMS II output multipliers are all service industries, where output is equal to final demand. There may be other explanations for the low tourism output multiplier that must await further research.
CONCLUSION

The RIMS II regional input-output system of the U.S. Department of Commerce can be applied to summarize the direct, indirect, and induced effects of visitor expenditures on any single county or multicounty economy in the United States. The system provides output, earnings, and employment multipliers in either the final-demand (i.e., normal) form or the direct-effect (i.e., ratio) form for 471 industries and the household sector.

Visitor expenditure categories can be coded into RIMS II industries to produce composite tourism multipliers, as long as visitor purchases of goods are transformed into output measures through trade margins. These can be compared to other industries in a region to rank the tourism sector in the power to produce indirect and induced contributions to the regional economy over and above its direct effects.

The 1994 version RIMS II system was applied to estimate the total output, earnings, and employment produced by visitor expenditures in Washington, D.C. When estimates of visitor expenditures were applied to the RIMS II final-demand multipliers to obtain estimates of total output, earnings, and employment for the city, the earnings and employment estimates appeared too low. Consequently, the RIMS II direct-effect multipliers were applied instead, and these produced more reasonable values for the implicit normal earnings multiplier (0.3478) and jobs multiplier (18.0 jobs per $1 million of delivery to final visitor demand).

Visitor demand in the city produced normal earnings and employment multipliers higher than three-quarters of other local industry aggregations. Their magnitudes suggest that the tourism sector is more highly linked to local suppliers than the average industry in the city, or its employees tend to spend more of their earnings within the city, or a combination of both.

Overall, the tourism multipliers estimated for the city of Washington were low relative to the multipliers available for comparable U.S. localities. The city is a relatively small geographic and population component of a large, highly industrially integrated metropolitan area. Consequently, all of its resident industries may be characterized by low earnings and employment multipliers as they purchase needed supplies and labor from outside the city.

The city government and other organizations concerned with growing the Washington city economy could strengthen such internal linkages through policies to encourage suppliers to tourism businesses to locate their facilities within the city limits. And to the extent that the tourism industry establishments hire city residents rather than commuters, the favorable impact of visitors on local sales and earnings would rise, along with employment.

The study also suggests a number of topics for further research. Research is needed on the local factors that demonstrate strong positive or negative relationships with the size of tourism multipliers, perhaps through a meta-analysis of extant studies (Glass, McGaw, and Smith 1981). This could

### TABLE 6

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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Local and suburban transit and interurban highway passenger transportation</td>
<td>2.33</td>
<td>125</td>
<td>1.1424</td>
<td>1.0668</td>
<td>2.7</td>
<td>133</td>
<td></td>
</tr>
<tr>
<td>B. Retail trade except eating and drinking</td>
<td>41.3</td>
<td>2,280</td>
<td>1.2322</td>
<td>1.1205</td>
<td>50.8</td>
<td>2,555</td>
<td></td>
</tr>
<tr>
<td>C. Automotive rental and leasing without drivers</td>
<td>8.09</td>
<td>360</td>
<td>1.3067</td>
<td>1.2617</td>
<td>300.9</td>
<td>13,223</td>
<td></td>
</tr>
<tr>
<td>D. Hotels and lodging places</td>
<td>230.2</td>
<td>10,480</td>
<td>1.3067</td>
<td>1.2617</td>
<td>300.9</td>
<td>13,223</td>
<td></td>
</tr>
<tr>
<td>E. Other amusement and recreation services</td>
<td>53.2</td>
<td>2,070</td>
<td>1.2724</td>
<td>1.1258</td>
<td>67.7</td>
<td>2,330</td>
<td></td>
</tr>
<tr>
<td>F. Overall</td>
<td>$594.6</td>
<td>33,535</td>
<td>1.2590</td>
<td>1.1536</td>
<td>$748.6</td>
<td>38,685</td>
<td></td>
</tr>
</tbody>
</table>

Sources: U.S. Travel Data Center (1996), U.S. Bureau of Economic Analysis RIMS II tables (1997), and authors’ calculations. Note: Details may not add to totals because of rounding.

### TABLE 7


<table>
<thead>
<tr>
<th>Measure</th>
<th>Implicit Final-Demand Multiplier</th>
<th>Implicit Final-Demand Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visitor expenditures</td>
<td>—</td>
<td>$2,396.4 million</td>
</tr>
<tr>
<td>Output</td>
<td>1.1841</td>
<td>$2,837.7 million</td>
</tr>
<tr>
<td>Earnings</td>
<td>0.3478</td>
<td>$748.6 million</td>
</tr>
<tr>
<td>Employment</td>
<td>18.0</td>
<td>38,685</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations based on U.S. Bureau of Economic Analysis RIMS II tables (1997). a. Number of jobs per $1 million of output delivered to final demand.
lead to estimation of tourism multipliers by one study that could be applied to similar areas, and to policy recommendations for increasing the total economic benefits from visitor expenditures. Indeed, comparisons of tourism multipliers for an area derived from a range of methods, such as input-output tables, ad-hoc models, and other approaches (Frechtling 1994, pp. 384-87), could suggest relative strengths and weaknesses of the different methods.

Another area of research needed to determine the validity of the input-output approach is investigation of the known limitations or weaknesses of such estimation of tourism multipliers. This would be particularly useful for comparing to alternative methods of estimating such multipliers (e.g., Fletcher 1994, p. 478; Frechtling 1994, pp. 384-87), could suggest relative strengths and weaknesses of the different methods.

Finally, it would be useful to know how tourism multipliers are actually applied in public policy-making and business operational and investment decisions. Research directed toward validating multiplier estimates of proposed projects after they have been built could guide policy makers on how much credence to place on ex ante multiplier estimates. Understanding the uses to which tourism multipliers are put and how well they reflect actual economic linkages would indicate the most promising paths toward improving them.

The latter are produced at the time they are consumed, so there is little violence done to theory to equate sales with output in this context. Since the term “output” is preferred by the expositors of the RIMS II analysis discussed in this study, it is the term used herein.

2. The “visitor” is the basic unit of analysis recommended by the United Nations and the World Tourism Organization and is defined as “any person traveling to a place other than that of his or her usual environment for less than 12 months and whose main purpose of trip is other than the exercise of an activity remunerated from within the place visited” (UN/WTO 1994, paragraph 20, p. 30).

3. Specifically excluded from this concept are those (1) traveling as part of an operating crew of a transport vehicle, (2) commuting to and from work, and (3) student trips to school or those taken while in school (U.S. Travel Data Center 1996, p. 42).

4. Indeed, BEA repeats this warning three times (U.S. Bureau of Economic Analysis 1997, pp. 5, 9, 11) and recommends using its RIMS II earnings and employment direct-effect multipliers where “estimates of the initial changes in earnings and jobs are available” (ibid., p. 11).

### REFERENCES


source: u.s. bureau of economic analysis rims ii tables (1997) and authors’ calculations.

### NOTES

1. It is conceptually true that sales receipts are different from the value of output necessary to consummate the transaction. The former is the value of what is sold, comprising what is immediately produced for sale and what is sold out of inventory. Output, on the other hand, is what is produced, comprising what is sold immediately and what is placed “on the shelf” for future sale. As a practical matter in tourism analysis, relatively little of what is sold to visitors comes out of inventory since most of what tourists buy are services.


