The World Tourism Organization, a United Nations specialized agency, is the leading international organization with the decisive and central role in promoting the development of responsible, sustainable and universally accessible tourism. It serves as a global forum for tourism policy issues and a practical source of tourism know-how. Its membership includes 158 countries, 6 territories, 2 permanent observers and over 400 Affiliate Members.
THE ECONOMIC IMPACT OF TOURISM
OVERVIEW AND EXAMPLES OF MACROECONOMIC ANALYSIS

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Abstract

The Tourism Satellite Account (TSA) is the authoritative source of the direct contributions of tourism demand to national economies. As such, it has been a groundbreaking development for understanding tourism as an economic activity in the same terms that, for example, manufacturing or agriculture are understood. However, as it is an economic account, the TSA is not designed to generate all of the economic impact variables that policy-makers may need. Additional macroeconomic analysis tools can be used to extend the understanding of tourism’s impact on national economies (including indirect and induced effects): Input-output Models, Social Accounting Matrices, and Computable General Equilibrium models. This paper discusses the advantages and limitations of each of these, and provides recommendations on when to use each tool as the optimum technique in tourism economic analysis. Finally, it lists constraints and recommends principles for a UNWTO-approved methodology for regional TSAs.

Launched by the UNWTO Statistics and Tourism Satellite Account Programme (STSA) in October 2013, the STSA Issue Papers Series aims to showcase the relevance of measuring and analyzing tourism, to disseminate the proper tools for doing so (including good practice examples), and to serve as platform that encourages the exploration of further developments in the field.

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<td>CGE</td>
<td>Computable General Equilibrium</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GVATI</td>
<td>Gross Value Added of the Tourism Industries</td>
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1. **Introduction**

1.1. It is commonly understood that a primary policy objective of most national governments is growing their economies. A growing national economy enlarges output that can satisfy domestic and international demand. A growing economy provides more jobs and expanded incomes for residents. A growing national economy increases revenues available to governments to finance services for residents in the way of defense, education, police and fire protection, social welfare support, infrastructure and other beneficial services. In short, a steadily growing national economy increases the choices available to residents and institutions that lead to improving the quality of life for all.

1.2. So it follows that national governments continually implement, monitor, update and improve policies designed to grow national income, personal income, employment and tax revenues. Prominent among these policies are those aimed at growing the effective demand of travelers away from home for transportation, hospitality, entertainment and recreation, retail trade and other services in the nation. If successful, such policies contribute to expanding aggregate demand and the national economy.

2. **The Tourism Satellite Account**

2.1. The Tourism Satellite Account (TSA) has been employed by more than 60 countries to measure the direct effects of one special kind of aggregate demand – Tourism Consumption– on their national economies (UNWTO 2010). It is designed to be a distinctive method of measuring the direct economic contributions of Tourism Consumption to a national economy. Its unique approach derives from applying the principles and structure of the internationally-adopted *System of National Accounts* (SNA) to measuring the direct economic impact of tourism.

2.2. Formally, the TSA comprises a set of inter-related tables that show the size and distribution of the different forms of Tourism Consumption in a country and the direct contributions to GDP, national value-added, income, employment and other macroeconomic measures of a national economy that result (TSA:RMF 2008). Under the currently approved framework, TSAs always relate to a national area or economy and focus on calendar years, although quarterly estimates are not unknown (Bureau of Economic Analysis, U.S. 2012).

2.3. While the TSA is the authoritative source of measures of the direct contributions that Tourism Consumption spending makes to a national economy, there are other variables and tools that are useful for assessing the economic impact of Tourism Demand and for determining the best policies to maximize their positive effects. This paper discusses these in detail, below.

3. **Definitions**

3.1. It is important here to establish some basic terminology covering various elements of “the economic impact of tourism”. Unfortunately, there is currently no consensus among those studying the field of tourism on the appropriate terms to describe these elements. The following terms and definitions are employed in this paper to encourage consensus and facilitate discussion of measuring the impact of Tourism Demand on the economy of country or a subnational region. These are based on an earlier paper (Frechtling 2011) but differ somewhat in an attempt to sharpen distinctions among different approaches to the macroeconomic analysis of tourism.
3.2. It is difficult to speculate how the study of tourism impact analysis can proceed without a set of definitions commonly accepted and employed. The ones provided here have the virtue of adopting relevant terms from the Tourism Satellite Account (IRTS 2008) or reflecting a significant degree of common usage:

- **Total Tourism Internal Demand** (or “Tourism Demand” in this paper): as suggested for the TSA, the sum of Internal Tourism Consumption, Tourism Gross Fixed Capital Formation, and Tourism Collective Consumption within the country under study for a past period, usually one year. At the current time, for the sake of international comparability, UNWTO recommends limiting the measurement of Total Tourism Internal Demand to Tourism Consumption. The two other items covered by the concept – Tourism Fixed Capital Formation and Tourism Collective Consumption – can be added at a later time (TSA:RMF 2008, paras. 4.113-4.115).

- **Tourism Economic Contribution**: the direct, positive effects of Total Tourism Internal Demand on a national economy for a past period, usually one year. This includes the TSA measures of Tourism Direct Gross Value Added (TDGVA), Tourism Direct Gross Domestic Product (TDGDP), Employment in the Tourism Industries, compensation of employees, gross operating surplus of business firms, and government taxes less subsidies.

- **Tourism Economic Benefits**: Tourism Economic Contribution plus the secondary effects (including both “indirect effects” and “induced effects”) on the economy under study for a past period, usually one year.

- **Internal Tourism Expenditure**: as defined in the TSA, the amount paid by visitors in the economy or country under study for the acquisition of consumption goods and services, and valuables, for visitors’ own use or to give away. It includes monetary expenditure by visitors themselves, as well as by others on behalf of visitors. The latter include monetary expenditures by employers for business travel, and by governments and Non-profit Institutions Serving Households for subsidizing costs to visitors. Internal Tourism Expenditure is made up of inbound tourism expenditure and domestic tourism expenditure.

- **Internal Tourism Consumption**: as defined in the TSA (see TSA: RMF para. 2.25), equals Internal Tourism Expenditure plus imputed values of services provided to visitors (e.g., exchanging vacation dwellings, lodging in own vacation homes, food and lodging provided by friends or relatives to visitors, free travel-related services provided by employers and government expenditures benefiting visitors) within the country under study for a past period, usually a year. This economic variable “is the basis for the compilation of Tourism Direct Gross Value Added (TDGVA) and tourism direct gross domestic product (TDGDP)” (TSA:RMF 2008, paras. 2.26-2.28).

- **Tourism Economic Impact**: the sum of an expanded set of direct and secondary effects of Tourism Consumption and other elements of Total Tourism Internal Demand on the national economy. These may be shown by disaggregated sets of households, of productive activities and/or of governments and may relate to a past or future period.

4. **Tourism economic impact domains**

4.1. It will aid this discussion to identify four key domains where estimating Tourism Economic Impact are useful to policy analysis and planning:
• Scope Domain – the two sets of direct impact and secondary impact.
• Aggregation Domain – the two sets of aggregated and disaggregated economic effects
• Time Domain – the past and the future
• Geographic domain – the national economy and sub-national economies.

4.1. The scope domain

4.2. The definitions above acknowledge that there are two Scope Domains considered in contemporary tourism economic impact analysis. One comprises direct effects of Tourism Demand on economic variables. These arise in establishments (“Tourism Industries” in the TSA [IRTS 2008, p. 50]), enterprises and governments in direct response to Tourism Demand. They include, but are not necessarily limited to, the economic variables of: value added, employment, labor compensation, gross operating surplus of business firms and government revenue predominantly from taxes. The TSA is effectively designed to measure the value added, employment, gross operating surplus of business firms and government tax revenue directly generated by Tourism Demand (TSA:RMF 2008, Table 6, pp. 60-63).

4.3. In addition to this Direct Impact Domain, there is the Secondary Impact Domain. In addition to the effects of Tourism Demand on the economic variables enumerated above, economists recognize “indirect” and “induced” effects that augment the direct economic impact. The “indirect effects” of Tourism Consumption recognize that as a nation’s productive units buy and sell from one another in response to Tourism Demand, they produce additional output, jobs and income. For example, visitors in a country purchase lodging in hotels. This requires hoteliers to purchase in-room amenities, linen services, communication services, insurance, maintenance services, utilities and other products from other establishments in order to serve their guests. These interindustry transactions generate output, value added, employment, labor compensation, gross operating surplus and government revenue in a host of establishments that may or may not ever directly serve visitors. And as these establishments supplying hotels purchase intermediate products from other establishments necessary to their production, they generate additional economic benefits.

4.4. Moreover, the Secondary Impact Domain also includes the “induced effects” of the original Tourism Demand that result as employees of tourism industry establishments spend their wages and salaries in the economy under study. This consumption generates output, value added, employment, labor compensation, and gross operating surplus for establishments that may or may not ever directly serve visitors. And certain government revenues are generated by this induced spending, as well.

4.5. Added to the direct impact of Tourism Demand (i.e. the Tourism Economic Contribution), the secondary impact comprised of indirect and induced effects comprise the Tourism Economic Benefits generated by Tourism Demand.

4.2. The aggregation domain

4.6. The TSA summary tables present measures of the Economic Contributions of Tourism in aggregated form, with value added and employment shown disaggregated by industry. However, it may be useful to also break out the effects of Tourism Consumption for households of different income classes, rural or urban locations, or whether headed by male or female adults. Moreover, industries might be broken down by size (e.g., microenterprise, small, medium or large) and by type of location (urban or rural). Income flows might be distinguished as to source (labor, capital). SNA 2008 stipulates that five sectors comprehend all of the institutional units in a national...
economic: Non-financial corporations, Financial corporations, Government units, Non-profit institutions serving Households and Households (SNA 2008, p. 2). So this domain can be characterized as having two members: aggregated (one or more of the SNA sectors) or disaggregated (sub-categories of one or more sectors). Note that SNA 2008 also sanctions the use of “key sector” to denote a specific collection of products or industries of particular importance to an economy (SNA 2008, p. 523). The use of the term “tourism sector” in this paper takes advantage of this convention.

4.3. The time domain

4.7. It is critical to achieving the purpose of this paper to recognize two time contexts in which the analysis of the economic benefits of Tourism Demand can occur. One is the past, when Internal Tourism Consumption and other elements of Tourism Demand have occurred in the economy and analysts are interested in measuring the resulting Tourism Economic Contribution or other variables indicated above. In this static context, economists would say we apply ex post analysis of the Tourism Demand that has occurred in order to measure its economic effects.

4.8. The other time context is the future, where an event or events is/are assumed to occur. A number of studies have applied ex ante analysis of what is likely to result from events such as Tourism Consumption generated by expanding a conference center, building a new sports stadium, hosting a festival, mounting a new advertising campaign and the like. A popular type of speculative analysis here is the policy simulation, where the potential impacts of new public policies, such as tax increases, public expenditures on tourism development and subsidizing air transport, are conjectured and examined. Since the event has not occurred, its impact cannot be measured, only estimated by some projection procedure. Such an exercise necessarily involves employing a model that seeks to simulate how economic variables are likely to change in response to such causes.

4.9. Thus, ex post measures of past economic change in response to Tourism Consumption and ex ante simulation, or estimation of future economic change, comprise the Time Domain of Tourism Economic Impact analysis.

4.4. The geographic domain

4.10. The TSA has been elaborated for national economies (TSA:RMF 2008). Indeed, the System of National Accounts 2008 refers to the “national economy” rather than to nations or countries in most cases. In this paper, “countries” and “national economies” are used as synonyms. So this can be considered one of two Geographic Domains for the purposes of this paper.

4.11. While TSA: RMF 2008 acknowledges that the TSA might be adapted to regional (i.e., subnational) levels (pp. 105-107), it also notes that since the System of National Accounts “does not define a specific framework for regional accounting and for regions in most countries”, it is not “possible to make a strict identification of tourism activity in the terms of the scheme used in the design of the System of National Accounts 2008 and the Tourism Satellite Account” (p. 106). Moreover, some productive activities cannot be regionalized, such as the main administrative units of business firms and the locus of value added for air transport services. As a consequence, UNWTO has not published standards for such an account. However, given the considerable interest in a “regional TSA,” this paper will address how this second, subnational Geographic Domain account might be elaborated.
5. **Tools for tasks**

5.1. An examination of studies of the economic impact of tourism published in academic journals and elsewhere (see References section at end of this paper) yields four tools that have been applied generally for macroeconomic analyses of tourism. These are:

- Tourism Satellite Account (TSA)
- Input-output (I-O) table and model
- Social Accounting Matrix (SAM)
- Computable General Equilibrium (CGE) models

5.2. The following discussion places each of these tools in its most appropriate domains for expanding knowledge of Tourism Economic Impact for a country.

5.1. **The Tourism Satellite Account (TSA)**

5.3. The single most important analysis tool developed in the last several decades to measure tourism demand and its direct effects on a national economy is the Tourism Satellite Account. The Tourism Satellite Account, or TSA, is a distinctive method of measuring the direct economic contributions of Tourism Demand to a national economy. Its unique approach derives from employing the principles and structure of the internationally-adopted System of National Accounts (SNA) to measuring the direct economic impact of tourism. The TSA comprises a set of inter-related tables that show the size and distribution of the different forms of Tourism Consumption in a country and the direct contributions to GDP, employment and other macroeconomic measures of a national economy that result (see TSA:RMF 2008 for a complete exposition, and Frechtling (2010) for a summary of these tables).


5.5. It seems appropriate to note here that the TSA comprises a wealth of statistics derived from a nation’s System of National Accounts and from its system of tourism statistics. These can, in themselves, be analyzed to inform decisions of various kinds, such as those relating to expenditures on tourism promotion and investment in visitor facilities or tourism related infrastructures; assessing the effects of public policies on tourism demand and supply; evaluating returns on investment in tourism development; and assessing efforts to attract international visitors.

5.6. The TSA is designed to ultimately produce five “main aggregates” that “provide summary indicators of the size of tourism” for a country (TSA:RMF 2008, p. 44-45). These main aggregates are:

- Internal Tourism Expenditure – the amount paid by visitors in the economy or country under study for the acquisition of consumption goods and services, and valuables, for visitors’ own use or to give away. It includes monetary expenditure by visitors themselves, as well as by others on behalf of visitors;

- Internal Tourism Consumption – tourism consumption of both resident and non-resident visitors within a country;
The Economic Impact of Tourism – Overview and Examples of Macroeconomic Analysis

- Gross Value Added of the Tourism Industries (GVATI) – total gross value added of all establishments belonging to the tourism industries, regardless of whether all their output is provided to visitors;

- Tourism Direct Gross Value Added (TDGVA) – the part of gross value added generated by tourism industries and other industries in the country that directly serve visitors in response to Internal Tourism Consumption; this is distributed to factors of production in the form of incomes such as labor compensation, interest, rents and profits;

- Tourism Direct Gross Domestic Product (TDGDP) – the sum of the parts of gross value added (at basic prices) generated by all industries in response to Internal Tourism Consumption plus the amount of taxes less subsidies on products and imports included within the value of this expenditures at purchasers’ prices.

5.7. In addition to these main aggregates of macroeconomic analysis, the TSA provides measures of other elements of Tourism Economic Contribution:

- Employment in the Tourism Industries (and, by extension, Tourism Employment) (TSA Table 7);

- Labor compensation – wages and salaries paid to tourism employees plus benefits associated with these earnings (TSA Table 6);

- Gross operating surplus of business firms – operating profits of enterprises generated by Tourism Consumption (TSA Table 6);

- Government direct and indirect taxes generated by Tourism Consumption (TSA Table 6).

5.8. System of National Accounts 2008 states the following concerning its objective:

. . . to provide a comprehensive conceptual and accounting framework that can be used to create a macroeconomic database suitable for analyzing and evaluating the performance of an economy. The existence of such a database is a prerequisite for informed, rational policymaking and decision-taking. (SNA 2008, p. 4)

5.9. It is essential to understand, as a satellite to the National Accounts, the Tourism Satellite Account has been defined for the same purpose. It provides the accounting database for evaluating the performance of the tourism sector and it does so with specific reference to the national economy for a country. And it satisfies these objectives quite admirably. Moreover, its contribution to understanding a tourism sector can be extended through several macroeconomic analytical tools profiled in the balance of this paper.

5.1.1. Limits of the Tourism Satellite Account

5.10. The TSA is the most valid method of measuring the size of the Tourism Economic Contribution to a country. It is based on observed values of Tourism Consumption of specific products produced by specified tourism industries, generating contributions to a nation’s Gross Domestic Product and employment. These are among the so-called “direct” or “primary” effects of tourism demand on the national economy.
5.11. These effects are focused on the macroeconomy. The disaggregation of direct impact available through the TSA is by individual Tourism Industry (e.g., Accommodations, Food and beverage serving, Air passenger transport) and product category. Moreover, there are economic consequences of the interactions between Tourism Demand and Tourism Supply beyond the direct effects which are not captured in a TSA. As discussed above under Scope Domain, these include the secondary effects comprising indirect effects and induced effects.

5.12. By design, secondary effect elements are not captured in the Tourism Satellite Account. Estimating secondary effects requires moving from defining and populating accounts to designing and implementing economic models. An “economic model” is a simplified representation of an economy that attempts to identify the major variables and relationships among them, array them in equations and use them to estimate macroeconomic variables that cannot be observed directly. It is the product of assumptions of the model builders about the important relationships in the world that produce salient results. We now examine the three popular types of macroeconomic models currently used to display economic effects of tourism consumption by types of households, types of income produced, and other variables of detail: the Input-Output Model, the Social Accounting Matrix and the Computable General Equilibrium Model.

5.2. The input-output (I-O) model

5.13. The first model developed years ago to assess the secondary impact of shocks to a national economy, tourism or otherwise, is the Input-Output (I-O) Model. The I-O Model is based upon an Input-Output Table constructed from the supply and use tables from a country’s System of National Accounts (Table 14.12 in SNA 2008). As SNA 2008 explains (chapter 28), we can substitute industries for the rows of the use table to produce an Input-Output Table. This table presents every industry in the country in the rows supplying inputs to every industry in the columns. Consequently, it has been called the “interindustry matrix” because it shows the flows of output from each industry to each industry in the country. It is a “rigorous accounting structure based on observations” (SNA 2008, p. 520).

5.14. So far, we have utilized the Input-Output Table as an account. With some transformations, this account can be turned into a very useful analytical tool, the Input-Output Model. We begin the modeling exercise by computing another account from the Input-Output Table, sometimes called the “Direct Requirements Table”, by simply substituting for each cell in the Input-output Table the ratio of the original value in the cell to the total for the entire column (i.e., industry). The Direct Requirements table, then, shows for each purchasing industry (in the column) the inputs directly required from different supplier industries (in the rows) to produce one unit of output. These ratios are formally called the “direct requirements technical coefficients” (Shaffer, Deller and Marcouiller 2004, p. 287).

5.15. Through manipulation (called “matrix inversion”) of this Direct Requirements Table, we derive the “Total Requirements Table”. At this point, we have moved from an account to a model, the “Input-Output (I-O) Model”. This model shows, for any amount of final consumption of a given industry’s output, the total amount of intermediate output required throughout the economy. The sum of these outputs throughout the economy over and above the direct output to meet Tourism Demand is called the “indirect effect” of the Demand, one of two types of secondary impact. To analyze the implications of Tourism Consumption in a country, we employ the vector of Tourism Expenditure by industry provided by Table 4 of the TSA. This provides the direct plus indirect effects of this demand on a country’s output. Moreover, we can compute various multipliers by dividing the total transactions, output, value added, income or employment generated by the initial amount of Tourism Demand (Shaffer, Deller and Marcouiller 2004, pp. 290-292).
5.16. So far, we have not considered any increase of final consumption of the households earning income from the interindustry transactions. It is reasonable to assume these households will spend part of the income they earn as a result of visitor spending on the outputs of the nation’s industries. Conceptually, this requires moving households from the Final Demand sector to the processing sector along with industries (Shaffer, Deller and Marcouiller 2004, p. 292; Isard, et al. 1998, p. 56). This generates more interindustry transactions and household incomes, which similarly cycle through the economy to some extent, producing more indirect and induced impact, respectively. If we are interested in isolating the induced effects, we can simply subtract the Input-Output indirect multiplier from the total multiplier including induced effects for the same dataset (Hara and Naipaul 2008, p. 17).

5.17. A country’s I-O Model can produce estimates of the output, income and employment multipliers for Tourism Demand for the relevant year. The most useful form of these is the ratio of the final measure (output, income, value added, etc.) to the initial Tourism Expenditure. Such multipliers can be compared to other types of consumer expenditure, such as for automobiles and health care, government expenditures on military bases and other facilities, and investment in infrastructure construction and maintenance. This assists policymakers in determining the total effects of public policies to expand Tourism Expenditure compared to alternative economic development programs.

5.18. Moreover, the I-O Model can be used to assess the ex post economic benefits of Tourism Expenditure related to a given event (Jones and Munday 2004). Here, we apply the Tourism Expenditure vector by industry attributable to the event to the I-O model to generate indirect, induced and total impacts. This informs discussions of how much government expenditure should be devoted to promoting and conducting festivals, concerts, sports events and other entertainment activities.

5.19. In addition, the Input-Output Tables display linkages between Tourism Industries producing for Tourism Expenditure and the industries supplying intermediate goods and services to those industries. If a country finds, for example, that its Accommodations industry is purchasing a great deal of its intermediate products from abroad (such as furniture and equipment), it can increase the macroeconomic contribution of serving accommodations demand by encouraging domestic enterprises to produce these items. This will reduce the leakages of demand to industries in other countries and increase the multiplier impact of Tourism Expenditure in the country under study.

5.20. Finally, it is important to note that I-O models continue to be popular today, seventy years after they were first developed. The structure of, and data required for, I-O models are well-understood and widely accepted. There is no question about how an I-O model must be constructed: it is specified in SNA 2008 (chapter 28). Indeed, Archer (1977) marks the first comprehensive exposition of I-O multipliers for tourism analysis, and studies continue to be published using these techniques 35 years later (See Hara 2008 for a current discussion). Consequently, researchers and users can be quite confident that the results of I-O models are comparable across nations.

5.21. It should be understood that we are applying ex post analysis here: examining what the Input-output Model based on an Input-Output Table for a past year tells us about what actually occurred for the year. We are interested in distinguishing the portion of GDP, labor compensation, employment, and other aggregates that are associated with the size and distribution of Tourism Demand among Tourism Characteristic Products for that year (Oosterhaven and van der Knijff
1987, p. 101). There is no intention here to simulate the effects of some hypothetical shock to an economy. So the so-called limitations of I-O modeling liberally referenced in academic research (e.g., Dwyer, Forsyth and Spurr, 2005) do not apply.

5.22. Regardless of any limitations in presenting accurate estimates of anticipated changes in demand, Input-Output models do not provide disaggregated estimates below the industry level. Analysts have developed Social Accounting Matrices to obtain such details.

5.2.2. Selected examples of input-output models in tourism analysis

5.23. A recent report on the U.S. Travel and Tourism Satellite Account provides examples of some of these variables from its Input-Output model (Bureau of Economic Analysis 2013), and these are shown in Table 1.

Table 1. Measures of tourism economic impact, United States 2011

<table>
<thead>
<tr>
<th>Measure</th>
<th>Value</th>
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<tbody>
<tr>
<td>Tourism Consumption</td>
<td>$872 billion</td>
</tr>
<tr>
<td>Tourism Direct Value Added</td>
<td>$415 billion</td>
</tr>
<tr>
<td>Tourism Direct Output</td>
<td>$821 billion</td>
</tr>
<tr>
<td>Tourism Indirect Output</td>
<td>$561 billion</td>
</tr>
<tr>
<td>Tourism Total Output (Direct plus Indirect)</td>
<td>$1,382 billion</td>
</tr>
<tr>
<td>Total Output Multiplier</td>
<td>1.68</td>
</tr>
</tbody>
</table>

Source: Bureau of Economic Analysis (2013) and author’s estimate

5.3. Social accounting matrices

5.24. SNA 2008 suggests expanding the Input-Output Supply and Use Table in matrix form and disaggregating households to produce a “Social Accounting Matrix (SAM)” (pp. 519-520). This moves beyond an account by incorporating survey information on income of individuals (employees, owners, transfer recipients) and the expenditures of households. This disaggregation can extend to presenting various types of persons employed, type of household, source of income, and other details.

5.25. However, unlike the I-O model, there is no single structure or presentation universally recognized. Rather, SAMs are constructed for individual purposes to disaggregate relationships among suppliers, purchasers, and factors of production. Specifically, a SAM can elaborate the institutions purchasing or supplying goods and services: business firms, households and governments. For example, the Household sector might be disaggregated by household income (Wagner 1997), by whether workers have formal employment contracts (Wagner 1997), by rural or urban location (Valle and Yobesia 2009), by male or female headed (Valle and Yobesia 2009), or by poor or non-poor (Valle and Yobesia 2009). Productive activities might be elaborated to distinguish factor incomes among households, investors and government (Akkemik 2012, Polo and Valle 2008).

5.26. Moreover, the choice of exogenous variables may differ among SAMs: domestic tourism expenditures, international tourism expenditures, government, enterprise, saving-investment and rest of world accounts (Akkemik 2012), government and saving-investment (Valle and Yobesia 2009), capital account and non-tourism demand (West 1993), government, saving-investment, inbound tourism (L and Lian 2010), Government, business inventories, extra-regional trade (Hara and Naipaul, 2008, p. 14). Finally, in some cases, the SAM is simply the I-O model with households comprising an additional row as a productive sector (Oosterhaven and Fan 2006, p. 353).
5.27. Sources of household income can be distinguished: labor earnings, property income, transfer payments, etc. The business sector might be broken down into size categories (e.g., small, medium and large sized enterprises). The markets for factors of production might distinguish labor by occupations and capital by sources. Finally, the actual consumption patterns of households can be modeled for these different groups.

5.28. SAMs are well-suited for ex post static analyses of tourism (Oosterhaven and Fan 2006; Polo and Valle 2008) through elaborating the I-O model. As for the I-O model, the Tourism Expenditure vector by industry from TSA Table 4 is applied to drive the SAM estimates.

5.3.1. Limits of social accounting matrices

5.29. As noted above, there is no standard way of elaborating a Social Accounting Matrix. Indeed, its flexibility in modeling different subcategories of supply and factors of production comprise its appeal. A result is that SAMs cannot be compared across countries except in the limited case when they are specifically elaborated in the same way.

5.3.2. Selected examples of social accounting matrices in tourism analysis

5.30. West (1993) looked at the impact of foreign visitors to Queensland, Australia, who stayed in commercial accommodations in 1990-91. He employed a SAM that distinguished labor and capital income, three types of savings and two types of government. Table 2 shows how three types of inbound visitors to Queensland contributed to Gross State Product. The table shows, for example, that International Visitors to Queensland produced 12.2% of the total contribution to Gross State Product through the Manufacturing Sector but 27.2 percent through the recreation sector.

Table 2. Distribution of impact on tourism-produced gross state product by productive sector, Queensland, Australia, 1990-91

<table>
<thead>
<tr>
<th>Sector</th>
<th>International Visitors</th>
<th>Australian Visitors from outside Queensland</th>
<th>Internal Queensland visitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>12.2%</td>
<td>12.5%</td>
<td>13.9</td>
</tr>
<tr>
<td>Trade</td>
<td>22.7</td>
<td>21.5</td>
<td>22.9</td>
</tr>
<tr>
<td>Transport</td>
<td>14.0</td>
<td>13.1</td>
<td>10.5</td>
</tr>
<tr>
<td>Recreation</td>
<td>27.2</td>
<td>28.1</td>
<td>27.4</td>
</tr>
<tr>
<td>Other</td>
<td>23.9</td>
<td>24.7</td>
<td>25.3</td>
</tr>
<tr>
<td>Total Spending ($ million)</td>
<td>$523.4</td>
<td>$974.6</td>
<td></td>
</tr>
</tbody>
</table>


5.31. Wagner (1997) reported on a SAM for the Guaraqueçaba region of Brazil for 1989 in order to assess the impact of visitor spending. The SAM distinguished employees on formal contracts from those without formal contracts, households by level of income, and income from labor versus capital. Using some representative estimates of visitor spending in the region, he found that 233 visitors and visitor-days (length of stay set at one day) generated one full-time equivalent job. Moreover, it took 1,371 visitors or visitor-days to generate one job without a formal employment contract, but only 214 visitors/visitor-days to generate one job with a formal employment contract (Wagner 1997, p. 606).

5.32. Hara and Naipaul (2008) investigated the potential impact of agritourism – the use of agricultural enterprises to provide leisure, recreation, entertainment, lodging and education for tourists – on four rural counties in central Florida for 2003. They employed a SAM to examine how visitor spending
for agritourism could boost incomes for the poorest residents. Their SAM distinguished labor from capital incomes, and nine income categories for resident households. They modeled the distribution of agritourism visitor spending and assumed 500 thousand such visitors in a year. Table 4 shows the different contributions to total impact from direct, indirect and induced effects. As shown, they found that 60 percent or more of the output or employment impact occurs at the direct level.

Table 3. Agritourism impact on household income distribution in Four Florida County Region, 2003

<table>
<thead>
<tr>
<th>Income Class</th>
<th>Addition to Income without agritourism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $10,000</td>
<td>23.1%</td>
</tr>
<tr>
<td>$10-15,000</td>
<td>28.9%</td>
</tr>
<tr>
<td>$15-25,000</td>
<td>24.4%</td>
</tr>
<tr>
<td>$25-35,000</td>
<td>20.6%</td>
</tr>
<tr>
<td>$35-50,000</td>
<td>15.5%</td>
</tr>
<tr>
<td>$50-75,000</td>
<td>12.8%</td>
</tr>
<tr>
<td>$75-100,000</td>
<td>10.6%</td>
</tr>
<tr>
<td>$100-150,000</td>
<td>10.4%</td>
</tr>
<tr>
<td>Over $250,000</td>
<td>11.4%</td>
</tr>
</tbody>
</table>


5.33. They also examined how this impact would be distributed among households by income level according to the SAM. Table 3 presents the percentage increase in household income over the situation without agritourism. The greatest increases occurred for the lowest income households, making this an efficacious pro-poor strategy.

Table 4. Potential agritourism impact on Four Florida County Region, 2003

<table>
<thead>
<tr>
<th>Impact</th>
<th>Direct Effects</th>
<th>Indirect Effects</th>
<th>Induced Effects</th>
<th>Total Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output ($thousands)</td>
<td>$50.0 million</td>
<td>$13.4 million</td>
<td>$20.4 million</td>
<td>$83.9 million</td>
</tr>
<tr>
<td>Output (% distribution)</td>
<td>60%</td>
<td>16%</td>
<td>24%</td>
<td>100%</td>
</tr>
<tr>
<td>Employment (jobs)</td>
<td>882</td>
<td>157</td>
<td>249</td>
<td>1,288</td>
</tr>
<tr>
<td>Employment (% distribution)</td>
<td>68%</td>
<td>12%</td>
<td>19%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note: details may not add to totals due to rounding.

5.34. Jones (2010) developed a SAM for Mozambique for 2003 and then examined the impact of the spending of different types of visitors. This SAM distinguished income from labor and capital and added accounts for taxes and investment to the Input-output approach. Table 5 presents a comparison of the output and income multipliers from visitors spending to the overall economy without visitor spending. For example, foreign visitor spending overall produced an output multiplier 15.3% higher than the multiplier for the rest of the economy.

Table 5. Normalized aggregate tourism multipliers for Mozambique, 2003

<table>
<thead>
<tr>
<th>Type of visitor</th>
<th>Normalized aggregate Output multiplier</th>
<th>Normalized aggregate Household Income multiplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign visitors overall</td>
<td>15.3%</td>
<td>14.5%</td>
</tr>
<tr>
<td>Business</td>
<td>17.2</td>
<td>16.1</td>
</tr>
<tr>
<td>Leisure</td>
<td>12.9</td>
<td>13.1</td>
</tr>
<tr>
<td>Self-drive</td>
<td>12.9</td>
<td>13.1</td>
</tr>
<tr>
<td>Domestic visitors overall</td>
<td>2.9</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Source: Jones (2010), page 688.
5.35. Li and Lian (2010) used a SAM to investigate the impact of tourism industries in Jiangsu Province, China for 2002 through a SAM. This SAM distinguished labor and capital income, urban from rural household, and urban households by seven income categories. They used the SAM to estimate the income multiplier of tourism industry receipts on the seven urban household income classes. Table 6 shows the ratio of income generated by tourism receipts to one unit of tourism receipt. It shows, for example, that the highest income class received the highest income boost from tourism industry receipts at 0.4310, but the upper middle-income group was not far behind. The poorest residents received negligible income boosts from tourism industry receipts.

Table 6. Net multiplier effects of tourism industries receipts on urban household income by income class, Jiangsu Province, China, 2002

<table>
<thead>
<tr>
<th>Income class</th>
<th>Multiplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest income</td>
<td>0.0591</td>
</tr>
<tr>
<td>Low income</td>
<td>0.0783</td>
</tr>
<tr>
<td>Lower middle income</td>
<td>0.2180</td>
</tr>
<tr>
<td>Middle income</td>
<td>0.2923</td>
</tr>
<tr>
<td>Upper middle income</td>
<td>0.4020</td>
</tr>
<tr>
<td>High income</td>
<td>0.2490</td>
</tr>
<tr>
<td>Highest income</td>
<td>0.4310</td>
</tr>
</tbody>
</table>

Source: Li and Lian (2010), p. 231

5.36. Polo and Valle (2008) investigated the impact of inbound visitor expenditures in the Balearic Islands for 1997. They compared measures of impact of an I-O model with households endogenous to a SAM distinguishing labor from capital income, central from regional governments and a capital account. Table 7 shows the estimates resulting from the two approaches as percentages of totals for the Balearics.

Table 7. Estimates of tourism contributions to Balearic Island economy as proportions of total regional economy, from input-output model and social accounting matrix, 1997

<table>
<thead>
<tr>
<th>Model</th>
<th>% total value added</th>
<th>% total employment</th>
<th>% imports from rest of Spain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input-output model</td>
<td>36%</td>
<td>30%</td>
<td>20%</td>
</tr>
<tr>
<td>SAM</td>
<td>72%</td>
<td>68%</td>
<td>65%</td>
</tr>
</tbody>
</table>


5.37. Akkemik (2012) developed a SAM for Turkey for 1996 and 2002 by elaborating the national I-O model to separate labor income from capital income and adding a savings-investment account. Table 8 indicates the growth in impact over the six-year period, as inbound visitor expenditures rose from US$1.3 billion to US$1.9 billion. However, the number of inbound visitors required to support one job rose from 91 in 1996 to 153 in 2002.

Table 8. Impact of inbound visitor expenditures on Turkish economy based on SAMs for 1996 and 2002

<table>
<thead>
<tr>
<th>Year</th>
<th>% of national output</th>
<th>% of GDP</th>
<th>% of national employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>1.05</td>
<td>0.90</td>
<td>0.58</td>
</tr>
<tr>
<td>2002</td>
<td>1.05</td>
<td>1.33</td>
<td>0.61</td>
</tr>
</tbody>
</table>

Source: Akkemik (2012), p. 796
5.4. **Computable general equilibrium models**

5.38. In addition to explicating the impacts of visitors spending on national and local economies, SAMs serve as the foundation for Computable General Equilibrium Models. As a class, these models are designed to incorporate variable price effects that characterize actual national and regional economies. Input-output models and SAMs necessarily assume fixed prices, wages, profits and rents, an unreasonable assumption if one wants to model the potential impacts of certain future “shocks” to an economy, such as additional inbound Tourism Consumption or a natural catastrophe.

5.39. In economic theory, general equilibrium analysis addresses how households, firms and markets interact to determine what is produced in a national economy, how it is produced and for whom. This analysis assumes markets are competitive, that prices for inputs and products move freely to equilibrate supply and demand, firms maximize profits, consumers (i.e., households) acquire their preferred collection of products, each product is produced under constant or decreasing returns to scale and government does not interfere to restrict these conditions.

5.40. In such a competitive general equilibrium world, the economy is at or moving toward the following states of equilibrium (Kehoe 1996):

- Supply equals demand in the market for each product
- Households as consumers maximize the utility of the range of products purchased
- Producers minimize costs subject to feasibility constraints and zero after-tax profits
- Ratios of marginal utilities of products for all consumers equal to the relative prices of these products
- Ratios of marginal costs of firms to produce goods and services equal to the relative prices of these products
- The revenues produced by one additional unit of input for all inputs equal for all firms and all products and equal to those inputs’ relative prices.

5.41. Computable General Equilibrium (CGE) models (sometimes called “Applied General Equilibrium Models”) extend the SAM structure to address how a national economy adjusts to a shock, such as increased Tourism Expenditure or higher tax rates, and reaches a new general equilibrium with the above features. A CGE model is “an economy-wide model that includes the feedback between demand, income and production structures and where all prices adjust until decisions made in production are consistent with decisions made in demand.” (Rossouw and Saayman 2011, p. 757). It expands a SAM through linking industries as producers, other institutions, purchasers and markets together by the concept of general equilibrium.

5.42. After the equations and variables are specified, time series of SAMs allow calibration of the parameters of the model so that its equilibrium states reproduce the values observed in the most recent SAM. Once the model is calibrated, it can be used to simulate the effects of shocks such as increased Tourism Expenditure, higher petroleum prices, higher wage rates in the tourism sector, an increase in tax rates and the like.

**5.4.1. Limits of CGE models**

5.43. CGE models require massive amounts of input data to satisfy the presentation of all the sectors and their relationships for a year. These data should be continually renewed to reflect year-to-year changes, but this is a very expensive undertaking and may not occur. Indeed, it appears common for a CGE model to depend upon data more than five years old. Developing a CGE
model for a single year and then assuming its equations apply over a number of subsequent years seems to be the norm (Gillespie, et al., 2002, p. 274). But the relationships outlined above may well change so that the results do not represent the current world but one that has passed. Moreover, the data requirements of CGE models are so vast that sectors are aggregated to prevent the overall model from becoming so complex that no one can understand it (Shaffer, Deller and Marcouiller 2004, p. 307). This subjects the model to aggregation bias, where dissimilar productive activities are lumped together and implicitly considered to share the same production functions (Shaffer, Deller and Marcouiller 2004, p. 307).

5.44. The quality of the input data required for CGE models affects their outputs. Proponents of this macroeconomic analysis tool note that the key outputs of CGE models are “direction of change” (Isard 1998, p. 334) and “order of magnitude estimates and qualitative insights” (Dwyer et al., 2000, p. 351) rather than point estimates.

5.45. CGE models suffer from the lack of validation from comparing a model’s results with what actually happens in the world. It is common to develop a CGE model for a base year, input the exogenous variables (such as visitor spending) and then adjust the equations so that the income and output results for each sector match the country totals for that year. But then these equations are assumed to hold unchanged into some number of years in the future (Gillespie, et al., 2002). Yet, comparisons of actual changes in macroeconomic variables such as GDP and employment as a result of a given policy implementation compared to those predicted by a CGE model are rarely presented (see Kirkup and Major 2006). So these models are seldom validated against the real world.

5.46. As opposed to the TSA, CGE models are models. They are simplified representations of reality based on assumptions of the model’s builders. And unlike the TSA, these assumptions are quite complex and are seldom fully explicated for the public in tourism studies. Moreover, in contrast to the I-O models, there is no standard CGE structure that is widely known and accepted (Dwyer et al. 2000). So it is impossible to tell what parts of the CGE output reflect realistic assumptions and which ones are simply products of the builders’ assumptions. Rarely do researchers present the equations, data vintages and data-gathering methodologies that comprise their CGE models. (For a rare exception, see Gillespie et al. 2002.)

5.47. The assumptions incorporated in a CGE model are based on certain economists’ views on how the world works and may be controversial (Shaffer, Deller and Marcouiller 2004, p. 307). For example, users of a CGE need to know whether it embodies the neoclassical economic assumption that investment adjusts to savings in an economy, or the Keynesian assumption that savings adjust to investment. There are arguments for both, but we can agree that the assumptions made should be specified in detail so the user can determine whether to believe the results of a policy simulation or not. Unfortunately, the structural details (parameter values, equation forms, input data vintage) are seldom published, denying users the ability to understand the actual assumptions of the model. This CGE opacity “risks bringing a useful analytical tool into disrepute” (Economist 2006, p. 68).

5.48. CGE models can be useful in ex ante analyses of possible shocks to an economy (see Frechtling 2011 for a detailed explanation). In contrast to I-O models, “CGE models can estimate the impacts of increased tourism demand under a range of alternate macroeconomic scenarios” (Dwyer, et al., 2000, p. 335). However, they provide no additional value for ex post analysis of the results of past shocks or estimation of any of the various multipliers discussed above developed through Input-Output analysis. This is because there is no advantage to be gained by modeling past economies and economic shocks to understand the past (Ivanov and Webster 2013, p. 48). The results of increased visitor spending or increased government spending on tourism development for a given year in the past has already occurred and is embodied in the Input-Output Table for that year. The
only challenge is to accurately identify these shocks and their results in the account. A TSA will present the direct effects of such changes on the national economy. And the I-O model, representing the actual interindustry relationships with households included, is more than adequate for examining the indirect and induced effects of past visitor spending.

5.4.2. Selected examples of CGE models in tourism analysis

5.49. Adams and Parmenter (1995) used a CGE model (ORANI-F and ORES) to project the effects of tourism on tourism industries in Australia from assuming that tourist arrivals grow 17 percent annually rather than the base case of 7 percent (p. 988) for the future 1989-1995 period. The model projected that the real exchange rate will rise in response to the additional visitor demand, depressing the output of export industries (agriculture, food, beverages, tobacco and mining) and of import-competing industries (chemicals, petroleum and coal products and transport equipment other than aircraft. Surprisingly, output in Queensland, “the economy of which is more oriented towards servicing overseas tourists than the other state economies” (p. 991) was projected to decline as a result of the assumed acceleration of inbound visitor growth.

5.50. Zhou, et al. (1997) employed a CGE model built on the economy of Hawaii calibrated on the 1982 base year to analyze the effects of a 10-percent decrease in visitor expenditure through both an Input-output model and the CGE model. The I-O model produces significantly larger declines in the tourism industries than the CGE model does since the latter allows for resource reallocation in response to the expenditure decline. Imports of the tourism industries also decline more than other industries. Finally the hotel industry showed the largest drop in output in response to the assumed expenditure decline: 9.66 percent.

5.51. Dwyer, et al. 2003 report on the use of the M2RNSW CGE model to simulate the impact on New South Wales (NSW) of four different tourism growth scenarios over a future two-year period. A “short run” scenario is distinguished from the “long run” scenario by allowing investment in new capacity, borrowing from abroad and variable real wages in the latter scenario. The simulation of an A$1 million increase in visitor spending is shown in Table 9. In most cases, the long run scenarios produce higher GSP and employment increases. However, if the increase in the spending is intrastate in NSW and substitutes for A1$ million that would have been spent on goods and services in NSW, or the expenditure increase is by inbound visitors throughout Australia, the impact on NSW is less in the long run.

Table 9. Change in gross state product (GSP) and employment (jobs) in New South Wales (NSW) from A$1 million increase in tourism expenditure for short run and long run

<table>
<thead>
<tr>
<th>Source</th>
<th>Short run GSP change (A$ million)</th>
<th>Long Run GSP change (A$ million)</th>
<th>Short Run Jobs Change (jobs)</th>
<th>Long Run Jobs Change (jobs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrastate substituted for interstate tourism</td>
<td>0.711</td>
<td>2.64</td>
<td>10.89</td>
<td>32.31</td>
</tr>
<tr>
<td>Intrastate substituted for other products</td>
<td>0.343</td>
<td>0.250</td>
<td>4.84</td>
<td>3.29</td>
</tr>
<tr>
<td>Interstate substituted for interstate tourism</td>
<td>0.707</td>
<td>2.67</td>
<td>11.32</td>
<td>33.78</td>
</tr>
<tr>
<td>Interstate substituted for other products</td>
<td>0.597</td>
<td>2.76</td>
<td>9.24</td>
<td>26.22</td>
</tr>
<tr>
<td>International tourism to NSW</td>
<td>0.572</td>
<td>2.15</td>
<td>9.45</td>
<td>26.22</td>
</tr>
<tr>
<td>International tourism to Australia</td>
<td>0.393</td>
<td>0.387</td>
<td>5.76</td>
<td>2.25</td>
</tr>
</tbody>
</table>

5.52. Dwyer, Forsyth and Spurr (2005) explored the potential impacts of a substantial special event in New South Wales, Australia, through the national Input-output model and the M2RNSW CGE model of the national and state economy. They assumed visitor spending and administration of the event would add $29.55 million from within Australia and $22.7 million from overseas inbound visitors. Table 10 compares the results of this simulation.

Table 10. Simulated change in output, GDP, gross state product and employment from a large event in New South Wales (NSW), Input-output and CGE models

<table>
<thead>
<tr>
<th>Measure</th>
<th>Input-output for NSW</th>
<th>Input-output for Australia</th>
<th>CGE Model for NSW</th>
<th>CGE Model for Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output (A$million)</td>
<td>$112.0</td>
<td>$120.1</td>
<td>$56.7</td>
<td>$24.5</td>
</tr>
<tr>
<td>GSP/GDT (A$million)</td>
<td>$38.9</td>
<td>$43.3</td>
<td>$19.4</td>
<td>$8.8</td>
</tr>
<tr>
<td>Employment (jobs)</td>
<td>521</td>
<td>592</td>
<td>318</td>
<td>129</td>
</tr>
</tbody>
</table>

Source: Dwyer, Forsyth and Spurr (2005), page 355.

5.53. Rossouw and Saayman (2011) investigated the impact of inbound tourism growing 18.4 percent a year rather than the 8.4 percent rate (“base case”) up to 2009. They employed the IDCGEM CGE model of the South African economy driven by the demand vector from Table 4 of their country’s TSA. They compared the results of this simulation to that produced by the national Input-Output model. Table 11 presents some of the results. Sectors showing declines in GDP in the CGE model include the export industries of agriculture, mining and fabricated metal products, and the import-competing sectors of textiles, clothing and footwear.

Table 11. Estimates of the impact of inbound visitor expenditures growing 18.4% annually, input-output model and CGE model (percent change over base case)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Input-output Model</th>
<th>CGE Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>1.42%</td>
<td>0.56%</td>
</tr>
<tr>
<td>Employment</td>
<td>1.98</td>
<td>0.82</td>
</tr>
<tr>
<td>Consumer Price Index</td>
<td>1.47</td>
<td>2.82</td>
</tr>
<tr>
<td>Manufacturing Value Added</td>
<td>1.33</td>
<td>2.11</td>
</tr>
<tr>
<td>Real Household consumption</td>
<td>0.96</td>
<td>4.18</td>
</tr>
</tbody>
</table>


6. TSA extension to sub-national accounts

6.1. The Tourism Satellite Account is now recognized as the superior method for measuring the contribution that Tourism Consumption makes to the national economy. There is increasing interest in extending the TSA concepts, definitions, coverage and framework to subnational areas in the form of the Regional Tourism Satellite Account (R-TSA). Such a subnational area or region of a country is understood to comprise a state, province, department (e.g., for France), metropolitan area or some contiguous aggregation of these within a country.

6.2. The salutary effects on national and regional economic policy-making of such a tool should be clear to all. Some of the considerable benefits of developing R-TSAs according to UNWTO standards are further described in Frechtling (2012).

6.3. Similarly, Frechtling (2012) details some foundational assumptions of recommending a specific framework for R-TSAs. The basic theme of these is that the TSA is now a recognized international brand with distinct constitution and applications that should not be weakened by R-TSA specifications established by UNWTO.
6.4. It is critical to recognize the constraints on specifying a formal “constitution” (the collection of
corcepts, definitions, classifications and framework specified for the R-TSA) for this tool. Some of
these have been noted in TSA:RMF 2008 (Annex 7) and IRTS 2008 (chapter 8), and others arise
from considerations discussed in this paper. These constraints include:

1. There is a lack of valid sampling frames for identifying visitors to subnational areas in many
countries;
2. The System of National Accounts does not define a specific framework for regional
accounts;
3. Some productive activities cannot be regionalized, such as:
   a. Headquarters and other main administrative units of business firms and
governments,
   b. Location of value added of the various transport services industries;
4. Current, high quality statistical information on supply for subnational areas is lacking in
many countries;
5. Subnational areas in a country may differ widely from one another, preventing applying
demand or supply inferences from one region to another;
6. Supply data collected for the country may be at the enterprise level rather than the
establishment level needed to allocate value-added accurately among regions.

6.5. After considerable discussion of R-TSA principles and alternatives, this author respectfully
presents the following standards to guide the development of regional TSAs acceptable to
UNWTO, regardful of the TSA brand and salutary for the worldwide growth of knowledge of the
economic consequences of domestic and international tourism:

1. It observes the TSA constitution as presented in IRTS 2008 and TSA:RMF 2008;
2. It acknowledges three visitor categories (IRTS 2008, p. 77)
   a. Inbound international visitors to country
   b. Residents of country but not region
   c. Residents of region (optional depending on usual environment);
3. The National Statistical Office of the country oversees elaboration of the R-TSAs in the
country (IRTS 2008, para. 9.33 on p. 88);
4. The National Statistical Office participates in the elaboration of the R-TSA and certifies that
it is comparable to the national TSA;
5. A valid Regional System of Tourism Statistics (R-STS) is developed and the National
Statistical Office certifies this for R-TSA development (IRTS 2008, para. 9.33 on p. 88);
6. It elaborates the ten tourism characteristic products and industries for international
comparability, supplemented by additional categories that particularly characterize the
region (IRTS 2008, Annex 3);
7. All of the following tables are compiled for the R-TSA (TSA:RMF 2008, chapter 4):
7. Conclusion

7.1. The Tourism Satellite Account is the outstanding tool for measuring the direct effects of Tourism Consumption on a national economy. But there are a host of additional consequences that policymakers, industry officials, workers in the Tourism Industries and others should be aware of. This paper has suggested how the Tourism Consumption vector by industry can be applied to the macroeconomic economic analysis tools of Input-output models, Social Accounting Matrices and Computable General Equilibrium models. The examples cited in this paper suggest the value and use of such extensions.

7.2. Table 12 is an attempt to synthesize what application of these tools to tourism analysis has taught us about their most productive uses. This author hopes this stimulates further research focused on extending our knowledge of the economic impact of tourism at national and subnational levels.

### Table 12. Optimum macroeconomic analysis tools for estimating elements of the economic impact for the scope, aggregation and time domains

<table>
<thead>
<tr>
<th>Element</th>
<th>Scope</th>
<th>Aggregation</th>
<th>Time</th>
<th>Optimum method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Tourism Internal Demand</td>
<td>Direct</td>
<td>Sectors</td>
<td>Ex post</td>
<td>TSA</td>
</tr>
<tr>
<td>Tourism Economic Contribution</td>
<td>Direct</td>
<td>Sectors</td>
<td>Ex post</td>
<td>TSA</td>
</tr>
<tr>
<td>Tourism Economic Benefits</td>
<td>Secondary</td>
<td>Sectors</td>
<td>Ex post</td>
<td>I-O model</td>
</tr>
<tr>
<td>Tourism Economic Benefits</td>
<td>Secondary</td>
<td>Sub sector details</td>
<td>Ex post</td>
<td>SAM</td>
</tr>
<tr>
<td>Internal Tourism Expenditure</td>
<td>Direct</td>
<td>Industry</td>
<td>Ex post</td>
<td>TSA</td>
</tr>
<tr>
<td>Internal Tourism Consumption</td>
<td>Direct</td>
<td>Industry</td>
<td>Ex post</td>
<td>TSA</td>
</tr>
<tr>
<td>Tourism Economic Impact</td>
<td>Secondary</td>
<td>Disaggregated industries, households</td>
<td>Ex post</td>
<td>TSA (only industries) and SAM</td>
</tr>
<tr>
<td>Tourism Economic Impact</td>
<td>Secondary</td>
<td>Disaggregated industries, households</td>
<td>Ex ante</td>
<td>CGE model</td>
</tr>
</tbody>
</table>

TSA = Tourism Satellite Account; I-O model = Input-output model; SAM = Social Accounting Matrix; CGE model = Computable General Equilibrium model
Bibliography


The Economic Impact of Tourism – Overview and Examples of Macroeconomic Analysis


The World Tourism Organization, a United Nations specialized agency, is the leading international organization with the decisive and central role in promoting the development of responsible, sustainable and universally accessible tourism. It serves as a global forum for tourism policy issues and a practical source of tourism know-how. Its membership includes 156 countries, 6 territories, 2 permanent observers and over 400 Affiliate Members.