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Tourism yield of different market segments: a case study of Hawaii

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This paper estimates the economy-wide economic impacts of tourism for various market segments. Moving beyond volume (arrivals) versus value (direct tourism expenditure), the author examines various economy-wide measures of economic impact. Different visitor spending has different flow-on effects, depending on each sector's taxation rate, import quotient and capital–labour ratio. It is important for destination marketing organizations and tourism policy makers to factor in these characteristics when considering the full economic impact of tourism expenditure.

Keywords: tourism yield; visitor expenditure; market segmentation; destination marketing, CGE modelling; Hawaii

Destination marketing organizations (DMOs) are naturally interested in finding the answer to the question, 'Which types of tourist spend the most in my destination?'. This leads on to the question of what is the best way to segment different tourist markets (Engel *et al*, 1994; Middleton, 1994; Kotler *et al*, 2006). As destinations reach their optimal carrying capacity and public sector funds allocated to destination marketing come under increasing scrutiny, DMOs need to target segments that maximize tourism expenditure in the destination. Tourism expenditure in some sectors of the economy will have larger direct economic impacts and/or indirect economic impacts than other sectors. The magnitude of these effects will depend on the backward and forward linkages of each sector, as well as the amount of imports each sector uses in its production. To assess these impacts, an economy-wide model of tourism and its linkages throughout the economy of Hawaii will be used to determine which tourist segments provide the best yield.

Hawaii is a relatively mature destination. An examination of the time series of tourist arrivals from 1950 until 2008 shows that the growth in the number of tourists exhibits almost classic Butler Tourism Area Life Cycle behaviour (Butler, 1980, 2006a,b). This was noted by Choy (1992). In 1950, the total number of tourist arrivals was almost 47,000. By 1967, the total number of tourists passed the 1 million mark, and by 1988 this figure had increased sixfold to 6.1 million tourists. Yet 20 years later, the total number of arrivals totalled

6.7 million. While there were relatively small fluctuations in the intervening years, it could be argued that Hawaii had reached its carrying capacity. Hence, it would be more beneficial to maximize the value of tourism to the destination as opposed to maximizing the volume of tourists to Hawaii.

This paper heeds Dwyer *et al*'s call for more research in measuring tourism yield and productivity in different destinations for different tourist market segments (Dwyer *et al*, 2007b, p 550). The research estimates economy-wide tourism yield for the destination of Hawaii, segmented by major geographical market and by accommodation type. The paper goes further than past research by tracing out the reasons why several market segments have larger total (direct and indirect) economic impacts in contrast to their relatively smaller direct impacts. Identifying segments with higher yield can guide DMOs more accurately in their target marketing. When destinations focus solely on tourist arrivals or aggregate tourism expenditure, tourism's benefits to the remainder of the economy can be overlooked.

Tourism yield

The issue of 'yield' (and the question of volume versus value) has been the subject of some discussion and debate among tourism scholars in recent years. Sparked by an Australian Government White Paper (2004), the concept of 'yield', the definition of 'yield' and ways to measure 'yield' created much discussion in a relatively short space of time (Dwyer *et al*, 2007a,b; Scott and Breakey, 2007; Dwyer, 2008; March, 2008). The term 'yield' means different things to different stakeholders: it can be measured in various ways depending on its definition. 'Yield' focuses on the economic impact of tourism but often does not take into consideration the social and environmental effects of tourism-related activities.

Dwyer *et al* (2007a) undertake yield analysis of the Australian inbound market in an attempt to uncover high-yield markets. Complicating the analysis to determine high-value tourists is the fact that the concept of 'yield' differs in terms of its unit of analysis. The different units of analysis include firm-level measures, industry-level measures and, finally, economy-wide measures. Additionally, 'yield' can be measured in different ways. It can be measured as direct visitor expenditure either per trip or per day, or it can be interpreted as a financial measure such as the 'rate of profit on tourism sales' or the 'rate of return on capital'. This financial measurement is sometimes expressed as gross operating surplus (GOS) in the National Accounts. Other economic measures of tourism yield include the contribution to gross domestic product (GDP), contribution to gross (GVA) or net value added (NVA) and employment and net benefits created (Dwyer *et al*, 2007a).

Hence, the assessment of which tourist segments are categorized as 'high yield' can vary depending on how 'yield' is measured, both in terms of the method and the unit of analysis. Dwyer *et al* (2007a) conclude that the different measures of yield generally do not provide consistent rankings for the origin markets. For example, Japanese honeymooners rank highest in terms of the yield measurements of GVA, GOS and net benefits, but generate the lowest employment per tourism expenditure dollar.

In a follow-up paper, Dwyer *et al* (2007b) outline and describe the contrasting uses of two different but related modelling techniques to measure tourism yield. The two different methods, tourism satellite accounting (TSA) and computable general equilibrium (CGE) modelling, serve two different purposes. If the object of the analysis were to determine the contribution to the tourism industry, then TSAs would be the appropriate method. If the purpose of the study were to understand economy-wide impacts, then CGE modelling would be the most appropriate method.

Other research has been undertaken to determine the 'value' of different market segments. For example, Laesser and Crouch (2006) segment international visitors to Australia by travel expenditure using a hedonic regression. These authors use primary data from the international visitor survey (IVS), capturing country of origin, purpose of trip, accommodation type, as well as demographic variables to estimate total expenditure in the destination. They find tourists from Europe spend approximately 20–30% less on a trip to Australia than those from Asia. Those staying in hotels are estimated to spend 20% more than the average international tourists to Australia. Those staying with friends and relatives are estimated to spend 8–14% less on average.

Another strand of research has segmented tourists based on expenditure. Rather than examine the expenditure patterns of various segments, the objective of this type of research is to determine the characteristics of those visitors who have relatively high levels of expenditure. This research typically profiles the demographic and psychographic characteristics of high, medium and low spenders at a destination or tourist attraction and examines which demographic variables are correlated strongly to expenditure levels (Pizam and Reichel, 1979; Woodside *et al*, 1987; Spotts and Mahoney, 1991; Legoherel, 1998; Mok and Iverson, 2000; Petrick, 2005; Craggs and Schofield, 2009). Research of this kind does not trace tourism expenditure as it circulates through the economy. These estimates capture the direct economic impacts only.

This paper goes beyond a description of the segments that have the largest direct tourism expenditures and seeks to investigate the segments that spend in higher 'pay-off' sectors, hence providing higher overall economic impacts to a destination.

Economy-wide modelling

When examining both direct and indirect economic impacts, two types of methods have been used: input–output modelling and CGE modelling. The traditional way to investigate the economic impact of tourism on an economy is through an input–output model. CGE modelling has been used extensively in other areas of economic policy enquiry, yet is still somewhat under-utilized when examining tourism impacts.

Input–output modelling has been the modus operandi for estimating the economic impacts of tourism over the past few decades. The benefits of input–output modelling include the ease and transparency through which changes in tourism demand flow through the economy via the production linkages (Briassoulis, 1991; Croes and Severt, 2007). Nevertheless, there are several

significant disadvantages of input–output modelling (Zhou *et al*, 1997; Blake *et al*, 2001; Dwyer *et al*, 2004; Croes and Severt, 2007; Polo and Valle, 2008). Two of the main disadvantages are that prices play no role in the model and that the standard model does not allow for capacity constraints. Other disadvantages include a lack of economic behaviour and lack of factor market substitution and import substitution possibilities. One of the common findings in comparing input–output models with CGE models is that the assumptions outlined above lead to the overestimation of economic impacts.

CGE models attempt to replicate working of the whole economy and the relationships between the industry, government, consumers and tourists in it. The behaviour of economic agents is modelled as a circular flow of income. These models are typified by incorporating economic agents (consumers, tourists, firms, etc) exhibiting optimizing behaviour, in the microeconomic theory sense, such that consumers maximize their utility subject to their budget constraints and firms maximize (minimize) their profits (costs) subject to their technological (resource) constraints. Further, they are equilibrium models whereby prices adjust to clear markets, so supply equals demand in each market, with the solution being Pareto optimal. In contrast to an input–output model, CGE models include a fully functioning exchange rate, resource constraints and a pricing mechanism.

CGE models have been used to look at a growing number of tourism-related issues. The range of issues covered have included topics from simulated tourism busts and booms (Adams and Parmenter, 1995; Zhou *et al*, 1997; Blake, 2000; Polo and Valle, 2008) to tourism taxation issues (Gooroochurn and Sinclair, 2005), tourism and trade (Sugiyarto *et al*, 2003), the economic impact modelling of terrorism (Blake and Sinclair, 2003; Pambudi *et al*, 2009) and foot-and-mouth disease (Blake *et al*, 2003).

CGE models also have limitations. Croes and Severt (2007) outline two strong assumptions implicit in CGE models. These are the assumption of neoclassical market conditions and economic agents and the assumption of constant economic equilibrium. Standard CGE models do not often incorporate market failures. If markets do not clear and there are factor surpluses, then this can reduce the impact of prices and hence affect the efficient allocation of resources. In addition, the workings of a CGE model are often seen as 'black boxes'. Croes and Severt (2007) conclude that CGE models are appropriate for larger spatial economies in long-run contexts. The limitations of input–output modelling coupled with the fact that Hawaii is isolated geographically from external labour markets resulting in supply constraints means the most appropriate modelling technique to answer this research question is CGE modelling.

A CGE model of Hawaii

The data used in the modelling come from two sources, both of which have been obtained from the State of Hawaii's Department of Business, Economic Development and Tourism (DBEDT). The benchmark data used for this study come from the 2005 Hawaii input–output table (DBEDT, 2008). The input–output table is composed of three distinct blocks: the inter-industry block, the

final demand block and the value-added block. The 2005 version for Hawaii is disaggregated into 68 industry sectors. The final demand block shows the value of expenditure spent on Hawaii residents' consumption, government consumption and investment, investment, exports and tourism expenditures. This tourism expenditure shows the value demanded (purchased) in 2005 of the 68 different sectors in the economy. For 2005, visitors to Hawaii were estimated to spend US$16.37 billion.

The second data source comes from the 2005 Annual Visitor Research Report (DBEDT, 2006). In this report, different tourist segment expenditures are provided. The report shows the different expenditure patterns by geographical segment as well as by accommodation type. This breakdown in expenditure by segment allows the opportunity for the tourism expenditure in the input–output table to be disaggregated by market segment. This involves distributing proportionally the aggregated tourism expenditure displayed in the input–output table so that the value of each market segment matches data reported in the Visitor Research Report (see Tables 2 and 4). Further proportional distributing had to occur so that the category expenditure reported in the Visitor Research Report matched the value of each industry sector's expenditure reported in the input–output table. This procedure was done using the RAS method. RAS is a widely used methodology to balance or update input–output tables. It is used when new information on the matrix row and column sums becomes available (Lahr and de Mesnard, 2004).

The CGE model used in this research is the relatively standard static CGE model. The static CGE model follows the interactions and relationships of a market economy and solves for a set of prices including production prices, factor prices and exchange rate and levels of production that clear all markets. Each industry is assumed to be made of profit-maximizing firms which use two main factors, labour and capital, as well as intermediate goods in its production function. Each production sector produces two types of commodities: domestic goods and goods for export. These goods are assumed to be imperfect substitutes and they combine with a constant elasticity of transformation (CET) production function. As such, sectors *i*'s production function can be represented as $Y_i = g(D_i, E_i) = f(K_i, L_i, A_{i.j})$, where g is the output transformation function and f is the input transformation function.

Output transformation is assumed to be the constant elasticity of transformation (CET):

$$Y_i = \Theta \left(\delta_i^e \, D_i^{\eta-1/\eta} + (1 - \delta_i^e) E_i^{\eta-1/\eta} \right)^{\eta/\eta-1}$$

where Y_i = output; E_i = exports; D_i = domestic production; η = the elasticity of transformation in total supply; δ_i^e = the calibrated share of exports; and Θ = the calibrated shift parameter in the transformation function.

The input transformation function is a nested Leontief–Cobb–Douglas production function. Labour and capital enter as a Cobb–Douglas value-added aggregate. Intermediate inputs from different sectors enter as a Leontief aggregate into a sector *i*'s production function:

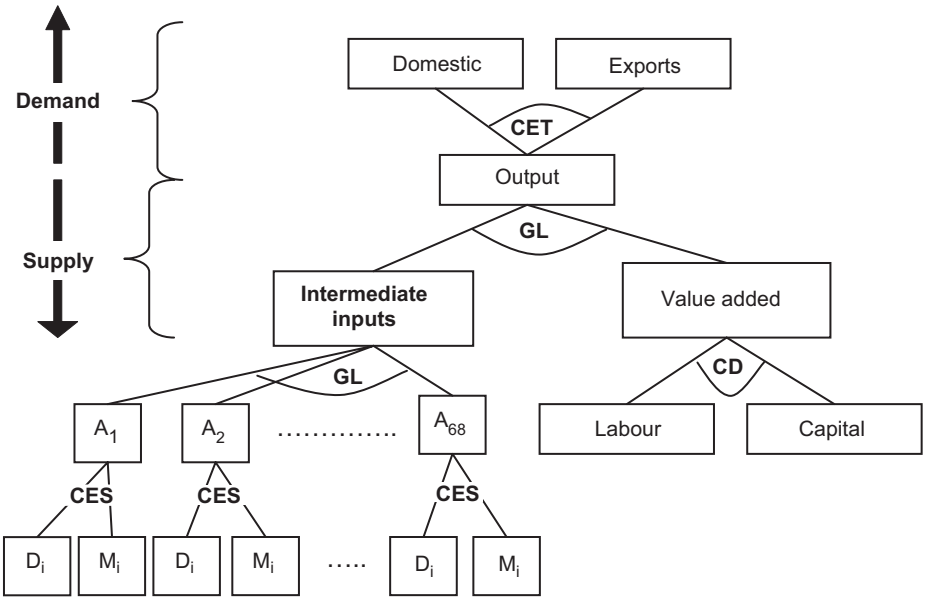

Figure 1. Production schematic.
Note: CET = constant elasticity of transformation; CES = constant elasticity of substitution; CD = Cobb–Douglas; GF = generalized Leontief.

$$f(K_i,\ L_i,\ A_{i,j}) = \min\left\{B_i L_i^{\alpha_i} K_i^{(1-\alpha_i)},\ \min\left\{\frac{A_{i,1}}{a_{i,1}}, \frac{A_{i,2}}{a_{i,2}}, \ldots, \frac{A_{i,j}}{a_{i,j}}\right\}\right\}$$

This is a constant returns-to-scale production function. An intermediate input, A, to a sector i from a sector j is an Armington aggregate of domestic output and imports (Armington, 1969). Users regard these goods as imperfect substitutes and they are assumed to have a constant elasticity of substitution (CES) between them

$$A_i = \Omega\left(\delta_i^m D_i^{\gamma-1/\gamma} + (1 - \delta_i^m) M_i^{\gamma-1/\gamma}\right)^{\gamma/\gamma-1}$$

where A_i = the Armington CES aggregate of domestic supplies, D_i, and imported supplies, M_i, for each sector; γ = the elasticity of substitution in the aggregate supply function; δ_i^m = the share of imported goods; and Ω = the calibrated shift parameter of the aggregated supply function. This production scheme can be represented in Figure 1.

The demand side of the modelled economy consists of the household sector, three types of government, investment demand and tourism demand. The representative household is endowed with capital and labour. In this model, there are three types of government: the federal military government, federal

civilian government and the state and local government. The federal government agents are assumed to be exogenous in the model. The state and local government collects tax revenues to maximize social welfare function. This model is characterized by fiscal neutrality so that public consumption remains constant. Any changes in tax revenues or changes in the prices paid by the government for public consumption goods result in changes in the level of transfers. This is done so that welfare calculations are based solely on household utility.

Tourism is modelled in the following way: a representative tourism household demands tourism in Hawaii (a certain quantity of a composite good and service) at an aggregated tourism price level, PT. In the benchmark, tourists are aggregated so there is a representative tourist accounting for all tourists' consumption. Tourism demand is obtained by maximizing the utility function of the representative tourist subject to their budget constraint. A constant elasticity of demand function is used whereby demand varies according to the price of the appropriate bundle of tourism goods and services; hence, Hawaii faces a downward sloping demand curve for its tourism. Tourism consumption, *TC*, is related to a composite tourism price (akin to a tourism CPI), *PT*, and the exchange rate, *PFX*, in the following manner:

$$TC = \Theta\overline{TC}\left(\frac{PT}{PFX}\right)^{\varsigma}$$

where TC = the base level of tourism consumption; ς = the price elasticity of demand for foreign tourism ($\varsigma < 0$); and Θ = a shift parameter ($\Theta = 1$ unless there is a decrease in tourism demand being modelled, in which case $\Theta = 0.9$ simulates a 10% decrease in tourism demand). The elasticity of demand has been set at 0.5. Tourists are endowed with foreign exchange.

Tourism consumption is composed of the consumption of different commodities, with a Cobb–Douglas function determining how tourists substitute between commodities. The utility of the representative tourist is a Cobb–Douglas function of consumption of the composite goods

$$TC = T\prod_i^n tc_i^{\theta}$$

where TC = aggregate tourism consumption; T = a shift parameter that is calibrated to ensure the model replicates the benchmark; θ = the share of commodity i in tourism consumption; tc_i = consumption by sector;

$$tc_i = \mathrm{X}\left(\delta_i^{tc}\, TCD_i^{\gamma-1/\gamma} + (1 - \delta_i^{tc})TCM_i^{\gamma-1/\gamma}\right)^{\gamma/\gamma-1};$$

TCM_i = imported production of a tourism consumption good; TCD_i = domestic production of tourism consumption good; γ = the elasticity of substitution between domestic goods and services and imported goods and services; δ_i^{tc} = the calibrated share of consumed tourism domestic goods; and X = the calibrated shift parameter in the substitution function.

Table 1. Visitor arrivals by geographical segment.

Visitor arrivals	Total	US West	US East	Japan	Canada	European	Oceania	Other Asian	Latin America	Other	Cruise
2002	6,452,834	2,486,914	1,582,563	1,483,121	189,890	111,275	108,835	111,347	13,092	302,019	63,776
2003	6,442,020	2,609,862	1,653,357	1,340,034	204,999	111,074	95,514	98,466	14,124	253,009	61,581
2004	6,991,927	2,768,002	1,805,377	1,482,085	217,163	114,948	132,130	98,480	13,760	280,148	79,833
2005	7,494,236	3,032,492	1,929,294	1,517,439	248,617	112,370	142,391	107,121	14,655	312,194	77,662
2006	7,628,118	3,219,948	1,953,316	1,362,878	280,920	106,032	135,813	117,532	19,020	332,647	100,012
2007	7,627,819	3,244,707	1,901,502	1,296,421	333,397	108,022	164,151	121,109	19,943	307,568	130,999
					Share of total visitor arrivals (%)						
2002	100	38.5	24.5	23.0	2.9	1.7	1.7	1.7	0.2	4.7	1.0
2003	100	40.5	25.7	20.8	3.2	1.7	1.5	1.5	0.2	3.9	1.0
2004	100	39.6	25.8	21.2	3.1	1.6	1.9	1.4	0.2	4.0	1.1
2005	100	40.5	25.7	20.2	3.3	1.5	1.9	1.4	0.2	4.2	1.0
2006	100	42.2	25.6	17.9	3.7	1.4	1.8	1.5	0.2	4.4	1.3
2007	100	42.5	24.9	17.0	4.4	1.4	2.2	1.6	0.3	4.0	1.7

Source: DBEDT Annual Visitor Reports, various years.

Table 2. Visitor expenditure by geographical segment, 2005.

2005 arrivals	Total	US West	US East	Japan	Canada	European	Oceania	Other Asian	Latin America	Other	Cruise
Expenditure (US$ million)	16,374.6	6,004.8	4,972.0	3,100.1	631.5	283.0	295.2	228.0	38.5	757.1	64.4
Share of expenditure (%)	100.0	36.7	30.4	18.9	3.9	1.7	1.8	1.4	0.2	4.6	0.4

The tourism economy of Hawaii

Although tourism in Hawaii is a relatively mature market, there are still dynamic shifts taking place with regard to the market segments. Tourist arrivals passed the 7 million mark in 2005 (7.49 million). Analysing tourist arrivals by point of origin (Table 1) in 2005, tourists from US West – the western portion of the US mainland – comprised just over 3 million visitors to Hawaii. This segment was 40.5% of total visitors to the islands. Visitors from US East comprised 25.7% of total visitors (or 1.9 million visitors), while Japanese visitors comprised 20.0% of total visitors (1.5 million visitors). These three market segments total 86% of total tourists. Since 2004, visitors from US West have increased in absolute terms in addition to a proportion of total visitors. Japanese visitors and US East visitors have decreased in both absolute and relative terms in recent years.

Table 2 shows tourist expenditure by geographical segment for 2005. US West visitors comprised 40.5% of visitor arrivals, yet these same visitors contributed to 36.7% of the total direct tourism expenditure. Comparing the share of arrivals to the share of expenditure across all market segments, the US East, Canadian and European visitors' share of expenditure is higher than their share of arrivals in 2005, while the US West, Japanese and Oceania visitors' share is lower.

A similar type of analysis can be done when segmenting by accommodation type. Table 3 shows that while visitors staying in hotels still comprise the largest segment of visitors staying in Hawaii, their number as a proportion of total arrivals has declined from 2002, while those visitors staying in condominiums and timeshare accommodation and the 'other' segment have seen an increase in their share. Visitors staying in 'other' consist of visitors staying in bed and breakfast accommodation, rental houses, staying with friends and relatives (VFR) or those staying in a combination of different accommodation types throughout their stay in Hawaii.

Expenditures for hotel visitors were just over US$9 billion in 2005. This made up 55% of total visitor expenditure, while visitors who stayed in condominiums spent US$2.23 billion in 2005. Comparing Table 3 to Table 4 for 2005, the share of visitors staying in hotels and timeshare accommodation is lower than the share of expenditure for these segments. The converse is true for the condominium and other segments.

However, DMOs need to move beyond simple volume versus value type analyses to determine the attractiveness of differing marketing segments. There is a need to determine in which categories tourists are spending and how money spent in these categories flows throughout the economy.

Overall, visitors to Hawaii spend 37% of their expenditure on lodging, 20% of their budget on food and beverages, 19% of their budget on shopping, 9% on entertainment and recreation, 9% on transportation and 7% on all other expenses. Not surprisingly, there are differences by geographical segment. In the lodging category, US West, Canadian and European visitors spend relatively more than the remaining segments, while Japanese visitors spend almost twice as much on shopping as the average visitor to Hawaii. Cruise visitors spend relatively more on entertainment and recreation – a result of shore tours – and relatively less on food and beverages and lodging, as they mostly eat and sleep

Table 3. Visitor arrivals by accommodation segment.

Visitor arrivals	Total	Hotel only	Condo only	Timeshare only	Other
2002	6,452,834	3,905,218	821,834	288,798	1,436,984
2003	6,442,020	3,794,297	863,570	294,224	1,489,930
2004	6,991,927	4,169,795	883,050	344,652	1,594,430
2005	7,494,236	4,374,061	945,667	390,677	1,783,831
2006	7,628,118	4,184,424	982,723	473,672	1,987,300
2007	7,627,819	3,996,219	1,014,850	500,571	2,116,179
			Share of total visitors (%)		
2002	100.0	60.5	12.7	4.5	22.3
2003	100.0	58.9	13.4	4.6	23.1
2004	100.0	59.6	12.6	4.9	22.8
2005	100.0	58.4	12.6	5.2	23.8
2006	100.0	54.9	12.9	6.2	26.1
2007	100.0	52.4	13.3	6.6	27.7

Table 4. Visitor expenditure by accommodation type – 2005.

2005	Total	Hotel only	Condo only	Timeshare only	Other
Expenditure (US$ million)	16,374.6	9,047.0	2,225.9	521.5	4,580.2
Share of expenditure (%)	100.0	55.3	13.6	3.2	28.0

aboard the vessels. The 'Other Asian' and 'Latin American' segments spend marginally more on entertainment and recreation than the average as a proportion of their budget. Table 5 shows the share of expenditure by category for each geographical source market for 2005.

Table 6 is analogous to Table 5 but segmented by accommodation type. Again, differences by segment exist. Tourists staying in hotels and condominiums spend relatively more on lodging compared with tourists staying in timeshare accommodation and other accommodation types. This result is fairly self-explanatory, as one of the reasons for investing in timeshare is for a less expensive holiday and those visitors in the 'other' category are VFR visitors or staying in a bed and breakfast; hence, timeshare visitors spend relatively more on food and beverages and transportation and the 'other' segment spends relatively more on transportation and shopping.

Analysing on which goods and services tourists spend their money has implications when calculating the total economic impacts of visitor expenditure. Different industries have different import quotients, different backward and forward linkages with other industries, different capital and labour intensities and hence different multipliers and economy-wide impacts.

Table 5. Share of category expenditure by geographical segment, 2005 (%).

Expenditure distribution	Total	US West	US East	Japan	Canada	European	Oceania	Other Asian	Latin America	Other	Cruise
Total food and beverages	*19.7*	*20.8*	*20.1*	*16.6*	*20.5*	*20.2*	*20.6*	*20.7*	*18.3*	*20.3*	*12.5*
Restaurant food	13.5	13.9	14.3	11.6	12.4	14.7	14.0	13.5	11.8	13.9	8.6
Dinner shows and cruises	2.2	2.1	2.5	2.1	2.2	1.4	2.3	3.4	2.7	1.4	2.2
Groceries and snacks	4.0	4.8	3.3	2.9	5.9	4.2	4.3	3.9	3.8	5.0	1.8
Entertainment and recreation	*9.3*	*9.4*	*10.2*	*7.5*	*8.2*	*8.1*	*8.3*	*11.3*	*10.0*	*8.7*	*29.1*
Total transportation	*8.6*	*9.6*	*9.6*	*4.3*	*9.7*	*12.1*	*6.5*	*7.1*	*8.8*	*9.5*	*9.9*
Interisland airfare	1.5	1.3	1.7	1.4	1.5	2.4	1.8	2.6	1.7	1.6	3.9
Ground transportation	0.9	0.5	0.6	1.8	0.7	1.7	1.4	1.3	1.0	1.4	1.6
Rental vehicles	5.5	7.0	6.5	1.0	6.5	7.4	2.9	2.8	5.2	5.6	3.6
Gasoline, parking, etc	0.7	0.9	0.9	0.1	0.9	0.6	0.4	0.3	0.8	0.9	0.7
Total shopping	*18.8*	*13.7*	*13.1*	*38.8*	*11.7*	*11.4*	*22.2*	*26.5*	*20.3*	*19.4*	*22.5*
Fashion and clothing	6.4	5.2	4.5	10.0	5.7	5.2	12.2	8.3	12.0	10.8	6.7
Jewellery and watches	3.6	3.2	3.2	5.5	1.8	2.2	3.9	5.0	1.6	1.7	6.4
Cosmetics, perfume	0.7	0.2	0.2	2.2	0.2	0.3	1.5	3.0	0.7	0.7	0.4
Leather goods	2.9	0.4	0.3	13.4	0.3	0.4	1.0	3.7	0.4	1.0	0.4
Hawaii food products	1.9	1.4	1.3	4.1	1.1	0.6	0.7	3.4	1.6	1.2	2.4
Souvenirs	3.5	3.2	3.7	3.6	2.6	2.7	2.8	3.1	4.0	4.1	6.3
Lodging	*37.0*	*40.4*	*38.7*	*26.9*	*44.1*	*42.3*	*37.2*	*29.2*	*33.8*	*37.1*	*17.5*
All other expenses	*6.6*	*6.0*	*8.2*	*5.7*	*5.8*	*5.8*	*5.3*	*5.3*	*8.8*	*5.0*	*8.4*
Total	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*

Table 6. Share of category expenditure by accommodation segment, 2005 (%).

Expenditure distribution	Total	Hotel only	Condo only	Timeshare only	Other
Total food and beverages	*19.7*	*19.0*	*18.6*	*27.1*	*20.9*
Restaurant food	13.5	14.2	10.8	16.6	13.0
Dinner shows and cruises	2.2	2.3	2.0	3.6	2.0
Groceries and snacks	4.0	2.4	5.8	7.0	6.0
Entertainment and recreation	*9.3*	*9.9*	*9.2*	*15.7*	*7.3*
Total transportation	*8.6*	*6.1*	*8.7*	*13.6*	*12.8*
Interisland airfare	1.5	0.0	0.0	0.0	5.5
Ground transportation	0.9	0.8	0.3	0.5	1.4
Rental vehicles	5.5	4.8	7.5	11.6	5.1
Gasoline, parking, etc	0.7	0.6	0.9	1.5	0.8
Total shopping	*18.8*	*17.9*	*13.0*	*18.3*	*23.7*
Fashion and clothing	6.4	6.6	5.2	6.7	6.6
Jewellery and watches	3.6	3.7	2.7	5.0	3.5
Cosmetics, perfume	0.7	0.6	0.4	0.4	1.0
Leather goods	2.9	2.3	0.7	0.4	5.5
Hawaii food products	1.9	1.0	1.0	1.8	4.0
Souvenirs	3.5	3.7	2.9	4.0	3.1
Lodging	*37.0*	*45.4*	*47.5*	*20.6*	*17.4*
All other expenses	*6.6*	*1.8*	*2.9*	*4.7*	*17.9*
Total	*100*	*100*	*100*	*100*	*100*

Findings

The tourism expenditure for each geographical segment was used to simulate an exogenous increase in tourism demand in the model. The results give the incremental economic impact of an additional visitor arrival and an additional visitor day from different geographical regions. A similar analysis was conducted for the accommodation segments. Table 7 shows the economic contribution of an additional visitor and of an additional day spent in the destination for each point of origin across several measures. The net benefit to the economy of Hawaii that a US West visitor spends in Hawaii is US$35.2. This compares to US$53.3 for an extra day that a Japanese visitor spends in the destination. On a per person basis, US East visitors contribute the most to net income (NVA) – US$469.6. Conversely, an additional cruise ship visitor is estimated to contribute only US$105.2 across their trip, as a significant amount of their expenditure is spent aboard the vessel.

Table 8 shows the ranking of each economic impact measure by geographical segment. As can be noted in Table 8, the Japanese visitor is more lucrative on a per day basis across all of the economy-wide measurements and cruise ship visitors are less attractive on a per day basis. However, for other segments the analysis is not so straightforward. The Other Asian segment ranks second for contribution to employment on a per day basis but fifth for its contribution to GOS on a per day basis. The reason for this needs to be traced back to the

Table 7. Economy-wide economic impacts by geographical segment (US$).

	US West	US East	Japan	Canada	European	Oceania	Other Asian	Latin America	Other	Cruise
Net benefits PD	35.2	40.7	53.3	27.0	28.4	34.3	35.4	29.9	30.7	12.0
GDP PD	36.7	45.2	70.7	36.4	39.6	48.3	51.7	43.4	42.6	18.4
NVA PD	39.5	45.5	64.3	29.2	31.2	38.8	41.7	34.3	34.7	14.7
GOS PD	19.0	20.9	25.8	15.1	14.6	18.6	16.4	13.8	15.5	3.6
Employment PD	20.5	24.7	38.5	14.1	16.6	20.2	25.4	20.5	19.2	11.1
Net benefits PP	334.7	419.9	304.7	357.2	350.4	276.8	272.9	344.5	337.8	85.5
GDP PP	349.7	466.3	404.1	482.4	488.1	389.3	398.1	499.8	468.5	131.5
NVA PP	375.5	469.6	367.2	386.4	384.3	312.6	321.5	394.9	381.8	105.2
GOS PP	180.5	215.2	147.5	199.4	180.1	149.9	126.0	158.7	170.7	25.7
Employment PP	195.0	254.4	219.7	187.1	204.3	162.7	195.5	236.2	211.0	79.5

Table 8. Ranking of economy-wide economic impacts by geographical segment.

Rank	US West	US East	Japan	Canada	European	Oceania	Other Asian	Latin America	Other	Cruise
Net benefits PD	4	2	1	9	8	5	3	7	6	10
GDP PD	8	4	1	9	7	3	2	5	6	10
NVA PD	4	2	1	9	8	5	3	7	6	10
GOS PD	3	2	1	7	8	4	5	9	6	10
Employment PD	5	3	1	9	8	6	2	4	7	10
Net benefits PP	6	1	7	2	3	8	9	4	5	10
GDP PP	9	5	6	3	2	8	7	1	4	10
NVA PP	6	1	7	3	4	9	8	2	5	10
GOS PP	3	1	8	2	4	7	9	6	5	10
Employment PP	7	1	3	8	5	9	6	2	4	10

Table 9. Economy-wide economic impacts by accommodation segment (US$).

	Hotel only	Condo only	Timeshare only	Other
Net benefits PD	51.6	32.4	19.4	31.2
GDP PD	44.7	39.8	29.2	39.9
NVA PD	58.2	34.8	23.5	38.2
GOS PD	32.5	19.8	5.6	7.8
Employment PD	25.7	15.0	17.9	30.4
Net benefits PP	375.8	364.6	164.7	392.1
GDP PP	325.9	448.2	247.5	501.1
NVA PP	424.1	392.2	199.1	479.6
GOS PP	237.1	223.5	47.5	98.3
Employment PP	187.0	168.8	151.6	381.4

relative lower spend on shopping and relatively higher spend on lodging for this segment. The accommodation sector is more capital-intensive and the retail and related sectors are more labour-intensive. Thus, the Other Asian segment ranks relatively higher for its contribution to employment on a per day basis (Employment PD) and lower for gross operating surplus per day (GOS PD).

On a per visitor basis, tourists originating from US East rank the highest on four out of the five measurements – the exception being for the measurement of gross domestic product per person (GDP PP), where the Latin American segment ranks the highest (Table 8). Each US West visitor who spends relatively more of their tourism expenditure on accommodation and relatively less on shopping (Table 5) contributes relatively more to GOS than to employment, although on an absolute basis the dollar value is not too dissimilar (US$180.5–195.0) compared to other geographical segments.

Examining the same economy-wide economic impacts by accommodation type (Table 9), the net benefits to the host destination vary from US$51.6 for those visitors staying solely in hotels to US$19.4 for timeshare visitors on a per day basis. In terms of per day contribution to GDP, the range of impacts is less varied, with hotel visitors contributing US$44.7, while condominium and other accommodation visitors contribute around US$40 per day and timeshare visitors contribute US$29.2 for this measure of economic contribution.

On a per visitor basis, with the exception of the contribution to labour (employment PP), hotel, condominium and other accommodation visitors contribute almost double the impact than timeshare visitors. For example, in terms of net income per person (NVA PP), an additional hotel visitor contributes US$424.1, one condominium visitor contributes US$392.1 and an additional other accommodation visitor contributes US$479.6, while a single timeshare visitor contributes US$199.1 per trip.

Table 10 shows the ranking of each economic measure by accommodation segment. On a per day basis, visitors staying in hotels rank highest on four of the five measures, the exception being employment PD, where other accommodation visitors rank number one. In contrast, on a per visitor basis, other accommodation visitors rank the highest on four of the five measures, the exception being the contribution to capital (GOS PP), where hotel visitors rank first among the four accommodation categories.

Table 10. Ranking of economy-wide economic impacts by accommodation segment.

Rank	Hotel only	Condo only	Timeshare only	Other
Net benefits PD	1	2	4	3
GDP PD	1	3	4	2
NVA PD	1	3	4	2
GOS PD	1	2	4	3
Employment	2	4	3	1
Net benefits PP	2	3	4	1
GDP PP	3	2	4	1
NVA PP	2	3	4	1
GOS PP	1	2	4	3
Employment PP	2	3	4	1

The differing impacts can be traced back to how labour- and capital-intensive is the sector where the expenditure is made. Hotel visitors spend a higher proportion of their tourism budget on accommodation, which tends to be a more capital-intensive sector relative to other sectors; hence, hotel visitors contribute more to gross operating surplus relative to the accommodation segments.

The differences in values between NVA, GDP and net benefits come down to the different import quotients and tax/subsidies of the underlying sectors where tourists spend their money. From the 2005 Hawaii input–output table, the sectors with relatively high tax rates are the shopping-related sectors of retail trade and wholesale trade and the entertainment and recreation sector. The sectors which are relatively high import quotient are the shopping-related sectors of retail trade and wholesale trade, the transportation sector and the food and beverages-related sectors of eating and drinking and agriculture. The implications of these leakages can be followed through. Timeshare visitors spend relatively more on sectors with higher import content (transportation, food and beverages and entertainment) and less on accommodation, which has a lower tax rate and import content.

Conclusions

This study has shown the importance of looking beyond merely visitor arrivals and even total tourism expenditure in determining the economic-wide impact of different marketing segments. As with the discussion of tourism yield (Dwyer *et al*, 2007a,b; Scott and Breakey, 2007), estimating the economic value of each segment depends on what is being measured and who is to benefit.

Economy-wide impacts can be disaggregated into the contribution to labour, the return to capital owners and the proportion of this expenditure that is spent on imports and tax revenue collected. Hence, visitor spending in capital-intensive industry sectors provides relatively higher returns to capital. Conversely, labour-intensive sectors provide higher returns to labour. In segmenting by geographic market, on a per day basis, Japanese visitors to Hawaii provide the best return across several measures, while on a per visitor basis, visitors from US East provide the best return across a range of measures.

The implications of this for marketers would be to attempt to entice additional visitors from the US East segment at the same time as attempting to extend the length of stay of the Japanese visitor. Among some geographical segments, there are different impacts for capital owners and for labour with an additional visitor or an additional day spent in Hawaii. The reasons for this are the relative spend in different categories. In Hawaii for 2005, shopping-related sectors and food and beverages-related sectors tended to be more labour-intensive, while the accommodation-related sectors tended to be more capital-intensive.

By accommodation type, across most of the economy-wide economic measurements, increasing the length of stay by an extra day for visitors staying in hotels will maximize the economic return for the destination. This is due to the relatively high spending on lodging, a lower tax and lower import sector. The return for an extra visitor is maximized for those visitors using 'other' accommodation. This category includes rental houses and bed and breakfast establishments. Visitors staying in timeshare accommodation purchase a higher proportion of imports in their tourism consumption bundle. This results in lower economic benefits to Hawaii. When targeting visitors, policy makers need to delve deeper into the structure composition of their economies to understand the full economic impact of tourism expenditure. Policy makers need to work with the private sector to strengthen the tourism-oriented sectors' backward linkages to other sectors through the streamlining and marketing of different products, in addition to diversifying tourism attractions and activities to spread income and employment opportunities.

This research could be built upon in several ways. One direction in which to take the research would be to analyse the marketing cost of attracting the different segments and compare it to the economic contribution by each segment, to arrive at a comparative return on investment figure. Previous research in this area has focused on a marketing campaign approach to marketing return on investment (Perdue and Botkin, 1988; Siegel and Ziff-Levine, 1990; Pratt *et al*, 2009), while other research has examined marketing's return on investment in a more macro context (Kulendran and Divisekera, 2007; Kulendran and Dwyer, 2009).

Alternatively, it would be helpful to DMOs and tourism policy makers to incorporate full economic costings into the economic impact calculations. Different segments have differing energy consumption patterns and use destination resources with different intensities. Hence, estimating the economy-wide economic impacts of each segment accurately only provides DMOs with a partial view of the impact of tourism. This would involve estimating the sustainability and energy consumption of different segments for comparison. The literature in this direction has been limited, although appears to be growing where detailed and accurate data have been captured. Kim and Konan (2004) segment Hawaii's water, sewerage, electricity, gas and petroleum demand by residents versus visitors. Tabatchnaia-Tamirisa *et al* (1997) examine the energy use and energy intensity of international and domestic tourists in Hawaii. Jones and Munday (2007) link a TSA with an Environmental Satellite Account to estimate the environmental impacts of tourism in Wales by tourist type and compare this with the economic impacts generated by their visitor segments. This is an important area to pursue, given the priority of triple bottom-line accounting.

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