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Journal of Travel Research 2009; 47; 275 originally published online Aug 15, 2008;
DOI: 10.1177/0047287508322786

Journal of Travel Research
Volume 47 Number 3
February 2009 275-284

10.1177/0047287508322786
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Measuring the Return from Australian Tourism Marketing Expenditure

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Tourism Australia, the primary agency responsible for marketing Australia as a destination internationally, spends around 32% of its total marketing expenditure in Asian markets. Asia contributes around 40% of the visitor arrivals to Australia. When Tourism Australia invests public money to promote Australia as a tourist destination, there is a need to estimate the return per dollar investment. This article estimated the return per dollar investment in Asia using a dynamic modeling approach and cost-effectiveness analysis. The study found that the return per dollar investment is 17:1 for Asia and 8:1, 36:1, 3:1, and 7:1 for Japan, New Zealand, the UK, and the United States respectively. The results have implications for targeting the highest yield markets to increase the economic returns to Australia from its destination marketing activity. It is argued that the cost-effectiveness approach is a useful tool for destination managers to ensure the effectiveness of their marketing expenditure.

Keywords: *tourism demand; destination marketing; dynamic modeling; cost-effectiveness analysis; Australia; Asia*

Introduction

Tourism makes an important contribution to Australia's export earnings. In 2004/2005, foreign exchange earnings from tourism comprised 11.7% of Australia's total exports (Australian Bureau of Statistics [ABS] 2004/2005). The income generated from tourism contributed around 3.9% to Australia's gross domestic product (GDP) for 2003/2004 and contributed to 5.6% of total employment (Tourism Research Australia 2006b).

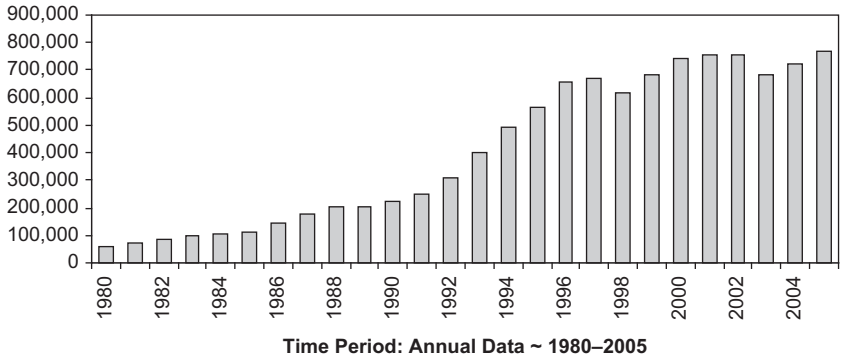
To maintain its share of a competitive market, Australia spends substantial amounts of money in its major tourist markets including the UK, the United States, New Zealand, and Asia to promote the country as a desirable destination to visit. This marketing activity is undertaken primarily through Tourism Australia, which is a federal government statutory authority responsible for promoting Australia as an international tourism destination. Tourism Australia's strategies involve consumer marketing, public relation and promotion, and trade marketing. The objective of tourism marketing is not merely to increase international visitor arrivals, but, primarily, to increase expenditure injected into Australia on goods and services purchased by tourists. Recently, there has been an increased emphasis on the importance of enhancing Australia's tourism "yield" by attracting visitors from high-spending markets (Australian Government 2004; Dwyer et al. 2007).

As shown in Figure 1, visitor arrivals from Asian region have exhibited a steady growth since the 1980s with marginal declines in 1998 and 2003 due to the Asian financial crisis and Severe Acute Respiratory Syndrome (SARS), respectively. Including Japan, they contribute 40% of the total international visitor arrivals to Australia. Within Asia, some markets are growing and some (such as Singapore, Malaysia, Japan, and Hong Kong) have matured. Newly emerging Asian markets (China and India) are growing at 9% and 24% respectively in 2006. The reason for high growth from China may include the promotional activity of Tourism Australia and the approved destination status (ADS), which Australia received in 1999. The ADS is a bilateral tourism arrangement between the Chinese Government and a foreign destination whereby Chinese tourists are permitted to undertake leisure travel in groups to that destination. High growth in India, in addition to that country's high rate of economic growth, may be attributed to promotion targeted at the honeymoon market.

To market Australia as a tourist destination, Tourism Australia works closely with the travel industry, the Government and the States/Territories. With the limited

Authors' Note: The Sustainable Tourism Cooperative Research Centre (STCRC), an Australian government initiative, funded this research.

Figure 1
Asia Tourist Arrivals (Measured in Numbers) in Australia



Source: The Australian Bureau of Statistics (ABS) publications 3401.0. Asia includes Hong Kong, India, South Korea, Malaysia, Philippines, Singapore and Thailand.

resources available, Tourism Australia allocates resources to markets and the market segments that offer high potential yield (which is basically the level of expenditure by international visitors on Australian tourism products). Origin markets are prioritized to focus on those offering a greater opportunity to influence inbound tourism growth. On average, Tourism Australia spends 32% of its total marketing expenditure in Asia, 18.3% in Japan, 3.3% in New Zealand, 24.5% in the UK, and 22.1% in the United States. Thus, including Japan, over 50% of marketing expenditure is in Asia. The comparison of countries' yield and Tourism Australia marketing expenditure shows that New Zealand has the lowest value for both yield and marketing expenditure compared to all other major markets (see figure 2).

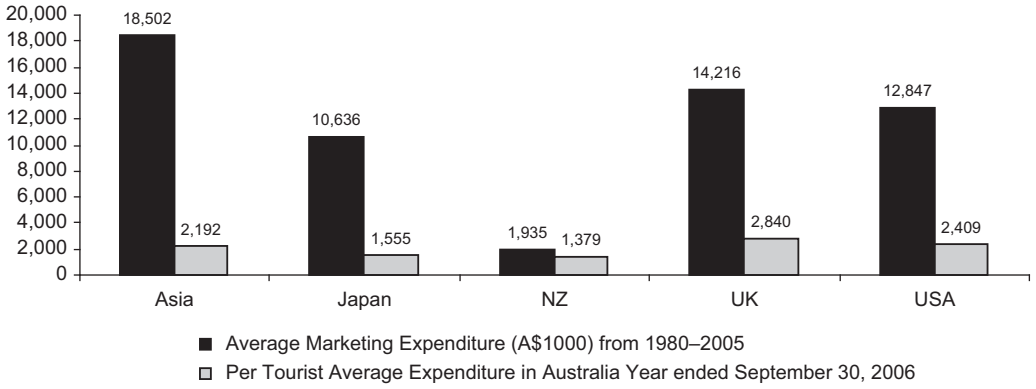
To assess the economic impact of Australian government marketing expenditure on Australian inbound tourism markets such as the United States, the UK, New Zealand, and Japan, previous studies have calculated the return per dollar investment (Crouch, Schultz, and Valerio 1992; Kulendran and Divisekera 2007; Access Economic Report 1997, 2002). These studies however, made no attempt to assess the economic impact of Australian government marketing expenditure on Asian markets. While Australia's tourism marketing expenditure data exists for the period 1980–2005, except for Japan, the total marketing expenditure data are available only in aggregate for Asian countries in which Australia undertakes destination marketing. These countries are Hong Kong, India, South Korea, Malaysia, the Phillipines, Singapore, and Thailand. (While Japan clearly is also part of 'Asia', in the Australian tourism marketing expenditure data set, it is separated from Asia because of its importance as an inbound market). The present study therefore uses the total marketing expenditure data to estimate the Asia marketing expenditure elasticity. This study did not consider China because of the limited availability of sample data.

This study is the first attempt to measure the impact of Tourism Australia marketing by estimating the dollar return per dollar investment for the overall Asia market. The approach uses a dynamic modeling approach combined with cost-effectiveness (CE) analysis. The remainder of the article is organized as follows: the tourism demand modeling approach is discussed in the following section. The time-series properties of data and dynamic modeling approach are then discussed. CE analysis is then used to estimate the dollar return per dollar invested in international tourism marketing. The final section emphasizes the policy significance of the CE approach to allocating marketing dollars to key inbound markets.

Tourism Demand Modeling Approach

According to the consumer theory of choice, demand for a given commodity depends on consumer income, prices, and any other variable specific to the commodity in question. In this context, the tourism demand, which may be defined for a particular destination as the quantity of the tourism product (i.e., a combination of tourism goods and services) can be determined by tourist income and the cost associated with foreign travel. The other noneconomic factors, such as destination attributes, also influence destination choice. When information regarding the attributes of the destination is incomplete it is reasonable to assume that marketing activities by the

Figure 2
Average Marketing Expenditure and Per Tourist Average Expenditure



Source: Australia Tourist Commission, Crouch (1992), and Tourism Australia Marketing Resource Allocation.

destination countries also significantly influence the destination choice.

The demand function for international tourism for a given destination may be expressed as a function of income, prices, and marketing expenditure.

$$Q = f(Y, P, PS, AF, SAF, A)$$

Where *Y* is the tourist disposable income; *P* is the price of tourism goods and services at the destination; *PS* is the price of broadly competing (or alternative) destinations; *AF* is the one-way airfare from the origin to the destination; SAF is the one-way economic airfare from the origin to a substitute destination; A represents marketing/advertising expenditure by the destination country in the origin country or region. The expected sign for Y is positive, P is negative, PS is positive, AF is negative, SAF is positive, and A is positive.

Variable Specification and Data

Demand for international tourism (Q) is measured in terms of per capita visitor arrivals to Australia. The relevant arrivals data were obtained from the Australian Bureau of Statistics (ABS) publications 3401.0. The reason for considering the per capita visitor arrivals is that the level of foreign tourism from a given origin is expected to depend on the origin population. Thus, the demand variable is usually expressed in per capita form (Witt, Brooke, and Buckley 1991).

The most appropriate measure of income (Y) is the real personal disposable income in the origin country. Since this was not available for all source countries, real GDP divided by the population (to remove the population effect) was used as a proxy for tourist income. The main economic indicators (Department of Statistics, Organisation for Economic Co-Operation and Development, [OECD]) publish annual time-series of GDP for each of the countries considered herein.

A realistic measure of tourism price (P) should reflect the cost of a common basket of goods and services consumed by tourists (Dwyer, Forsyth, and Rao 2000; Divisekera 2003). Because of unavailability of the relevant data, the real exchange rate was used as a proxy for tourism prices. To calculate the price of tourism products in Australia, the Australian consumer price index (CPI) was divided by the origin country CPI and multiplied by the bilateral exchange rate. This tourism price formulation is based on the assumption that tourists compare the cost of living in Australia with a domestic tourism experience.

The cost of transport (AF) from the origin country to Australia was measured by the one-way economic airfare to Sydney from Bangkok, Bombay, Kuala Lumpur, Jakarta, Singapore, Manila, Taipei, London, Tokyo, Auckland, and San Francisco. The cost of transport to a substitute destination (SAF) was measured by the one-way economic airfare to Hawaii from Bangkok, Bombay, Kuala Lumpur, Jakarta, Singapore, Manila, Taipei, London, Tokyo, Auckland, and San Francisco. The cost of transportation data were obtained from the ABC World Airways Guide and Passenger Air Tariff monthly publications published by International Air Transport Association (IATA) Netherlands.

To construct the substitute price (PS), past tourism demand studies (Martin and Witt 1988; Kulendran and Witt 2001; Song, Wong, and Chon 2003) have used the weighted average (based on the previous market share)

Table 1
Marketing Expenditure Data from the Australian Tourist Commission (ATC) from 1980–2005

Marketing Expenditure Data from the Australian Tourist Commission (ATC) (A$1000)					
Year	Asia	Japan	New Zealand	United Kingdom	United States
1980	17,109	329	196	626	959
1981	17,109	441	560	825	905
1982	17,109	583	432	865	755
1983	17,109	595	483	739	760
1984	17,109	1,080	504	1,261	5,473
1985	17,109	1,527	615	1,940	10,344
1986	17,109	1,742	489	1,491	9,934
1987	17,109	3,440	637	1,944	7,563
1988	17,109	2,140	789	3,717	7,444
1989	17,109	3,646	1,030	3,794	7,097
1990	17,109	8,423	1,581	4,928	6,090
1991	17,109	11,798	1,712	6,905	10,934
1992	17,109	14,619	2,962	19,255	20,806
1993	20,851	19,342	2,397	24,105	20,270
1994	21,802	21,036	3,127	23,205	19,213
1995	20,258	22,358	2,688	23,735	17,708
1996	21,160	16,800	3,351	22,882	18,092
1997	20,808	16,479	4,274	25,474	17,948
1998	20,832	19,277	3,625	31,780	23,258
1999	21,093	20,082	3,069	29,707	23,671
2000	16,341	16,409	2,728	25,652	22,246
2001	21,574	18,231	3,012	25,908	21,508
2002	18,495	14,846	3,247	21,941	16,556
2003	17,546	11,286	2,210	26,448	14,724
2004	17,150	17,239	2,710	28,467	18,077
2005	20,716	12,787	1,880	12,025	11,692

Sources: Marketing expenditure data: United States, Japan, Korea, New Zealand, United Kingdom: 1980–1989: Marketing Expenditure by the Australian Tourist Commission (table 3, p. 198). Geoffrey I. Crouch, Lance Schultz, and Peter Valerio. Marketing international tourism to Australia: A regression analysis. *Tourism Management* (June 1992). 1990–1991: Missing values—so calculated based on averages. 1992–2001: Australian Tourist Commission, 1992/1993 Budget Progress Report—2001/2002 Budget in AUD—Final Position Actuals. 2002–2004: Australian Tourist Commission, Overseas Allocation/Parliamentary Appropriations. 2005: Tourism Australia Marketing Resource Allocation, 2001–2006, Tourism Australia Annual Operating Plan 2005–2006. Asia Total, HK, India, Malaysia, Philippines, Singapore, Thailand: 1980–1992: Australian Tourist Commission, 1992/93 Budget Progress Report. (Added ALL applicable Asian countries, this is why the value (17,109) is the same for 1980–1992; we didn't have data for these countries prior to 1992). 1993–2001: Australian Tourist Commission, 1993/1994 Budget Progress Report—2001/2002 Budget in AUD—Final Position Actuals. (Added ALL applicable Asian countries or used the total ASIA group depending on how it was recorded each year). 2002–2005: Australian Tourist Commission, Overseas Allocation/Parliamentary Appropriations. (Used Asia group—as no individual Asian countries listed except for Japan).

of cost of living for tourists in competing destinations. To select the substitute destination, attributes such as geographic location, culture, distance of travel, climate, and sandy beaches have been considered in the past. In the case of Australian tourism, past tourism demand studies (Kulendran and Divisekera 2007; Kulendran 1996; Kulendran and King 1997) did not consider the weighted average approach to calculate the substitute price for U.S., Japanese, UK, and New Zealand tourists but selected Hawaii as a substitute destination for the Untied States, the UK, and Japan based on the characteristics such as sandy beaches and climate. Queensland and Hawaii have many of these assets in common. Kulendran and Divisekera (2007, p. 265) stated,

> While the use of weighted average of prices has its advantages when competing destinations are located relatively close to the tourist's origin country, it is not necessarily superior to the use of one destination as a substitute, for long haul destinations such as Australia, because of their uniqueness.

This study also considered Hawaii as a substitute long-haul holiday destination for Australia.

To measure the marketing expenditure (A) the nominal marketing expenditure (in $A) was converted to the currency of the country of origin of the tourist by multiplying the origin country/Australian exchange rate and dividing by the CPI of the origin country. The resulting

variable represents the purchasing power of expenditure on marketing in each of the foreign countries. Marketing expenditure data were obtained from Crouch, Schultz, and Valerio (1992). This data is set out in table 1.

The data in table 1 data contains Tourism Australia expenditure and industry contributions to Tourism Australia expenditure. As indicated, marketing expenditure data for individual Asian countries, excepting Japan, is not available. Furthermore, while the marketing expenditure data contains Tourism Australia marketing expenditure and industry contributions to Tourism Australia expenditure, it does not contain private sector and state/territory government marketing expenditure data undertaken independently of the Tourism Australia marketing program. The estimation of this additional marketing expenditure, and its effectiveness, faces substantial data limitations. As such, it is assumed that nongovernment marketing is equally distributed across markets and not concentrated in any of the specific markets being targeted by government.

A dummy variable (D_1 =1, when t = 2000, 0 otherwise) was included in the tourism demand model to represent the Olympic Games in Sydney, Australia in the year 2000. Another dummy variable (D_2 = 1, when t = Sept. 2001 and Dec. 2001, 0 otherwise) was included in the model to represent the September 11, 2001 incident in the United States.

A tourism demand model for Asia using the above explanatory variables was constructed using the weighted average based on the market share of the Australian inbound tourism demand from the Asian countries Hong Kong, India, South Korea, Malaysia, the Phillipines, Singapore, and Thailand. To measure the purchasing power of expenditure on marketing in Asia, nominal total marketing expenditure (in $A) in Asia was multiplied by the market share weighted origin country/Australian exchange rate and divided by the market share weighted CPI of the Asian countries.

Time Series Properties and Dynamic Modeling

This section introduces the tourism demand model estimation procedure to estimate the tourism marketing elasticity which is required in the CE analysis to calculate the return per dollar tourism marketing investment. The tourism demand model estimation begins with testing the time-series properties of economic variables Q_t, Y_t, P_t, PS_t, AF_t, SAF_t, and A_t that are included in the demand function. Conventional regression models assume that included variables are stationary. When the variables listed in the above model are nonstationary and their means, variance, and covariance change over time, the estimation of such model is likely to yield spurious relationships. Therefore, the Augmented Dickey Fuller (ADF) unit root test procedure was used to test whether the dependent and independent variables in the tourism demand models are nonstationary. The test has the null hypothesis H_0: nonstationary time-series (or unit root). When the null hypothesis is not rejected, it shows that the series has stochastic nonstationary trend and the order of integration is I (1). Unit root tests in this study were carried out using Eview 5.0 and the results show that the variables Q_t, Y_t, P_t, PS_t, AF_t, SAF_t, and A_t in the tourism demand model are nonstationary and have the order of integration I (1).

Having identified that the economic variables are I (1), the model can be estimated using cointegration analysis or a dynamic modeling approach. Previous Australian tourism demand studies (Kulendran 1996; Kulendran and King 1997) used Johansen's Full-Information Maximum estimate (FIML) for the long-run cointegration relationships. The advantage of using FIML approach is that it can detect more than one long-run cointegration relationship between variables. However, for a small sample (25 observations) the FIML procedure is not effective and therefore it was not considered. Another approach is to use the Engle and Granger (1987) two-step procedure (Kulendran and Divisekera 2007) to estimate the long-run cointegration relationship which assumes that there is only one long-run cointegration relationship. This procedure involves estimating the static regression by Ordinary Least Squares (OLS) method and then estimating the error- correction model (ECM) with the error correction term by the OLS method. In the long-run cointegration estimation procedure, all variables included in the model are in level and they are deleted from the model only when the variables appear with the incorrect sign. In the ECM modeling, all variables are first differenced (∇) stationary time-series and the t test were used to select the preferred model. The long-run information lost through differencing is reintroduced via an error correction term, which measures the extent to which the endogenous variables have temporarily departed from the long-run relationship.

For a small sample, Banerjee et al. (1986) suggest it is better to use dynamic modeling rather than static regression approach to avoid bias in the long-run estimates. In small sample estimation, a dynamic modeling approach seems to provide more reliable estimates than the cointegration analysis (Maddala 2001, p. 559). This study considers the dynamic modeling approach to estimate the tourism demand models. When economic variables are nonstationary, estimation of dynamic models by the OLS method has been discussed in Wickens

and Breusch (1988) and Banerjee et al. (1993). Dynamic models can be estimated by the OLS method when economic variables are nonstationary, only if variables have the same order of integration and combination of dynamic specification of variables are I (0) or stationary. The problem with the dynamic modeling procedure is that if the current and lagged terms are nonstationary and not cointegrated then the true process becomes nonstationary.

The simplest dynamic tourism demand model can be written as:

$$\begin{aligned} LnQ_t = {} & \alpha_0 + \alpha_1 LnQ_{t-1} + \delta_1 \ln Y_t + \delta_2 \ln Y_{t-1} + \delta_3 \ln P_t + \delta_4 \ln P_{t-1} \\ & + \delta_5 \ln PS_t + \delta_6 \ln PS_{t-1} + \delta_7 \ln AF_t + \delta_8 \ln AF_{t-1} \\ & + \delta_9 \ln SAF_t + \delta_{10} \ln SAF_{t-1} \, \delta_{11} \ln A_t + \delta_{12} \ln A_{t-1} + e_t \end{aligned}$$

Where e_t is the error term and $\alpha_1 < 1$. This model can be estimated using the OLS method.

In dynamic modeling, many lags can be introduced if quarterly or monthly data are used in the model estimation. In this study, where annual data is used, only one lag period is considered. This is because of the small sample size (obs = 25) assuming it is sufficient to capture the dynamic nature of tourism. To obtain the long-run income, price, price of substitutes, airfare, and marketing expenditure elasticity estimates we need to use some algebraic manipulation and assume that in the long-run:

$$\begin{aligned} LnQ_t = LnQ_{t-1};\ LnY_t = Ln\,Y_{t-1};\ LnP_t = LnP_{t-1}; \\ LnPS_t = LnPS_{t-1};\ LnAF_t = LnAF_{t-1}; \\ LnSAF_t = LnSAF_{t-1} \text{ and } LnA_t = LnA_{t-1}. \end{aligned}$$

A tourism demand dynamic model can be written as;

$$\begin{aligned} LnQ_t = {} & \alpha_0/(1-\alpha_1) + (\delta_1 + \delta_2)/(1-\alpha_1) \ln Y_t + (\delta_3 + \delta_4)/(1-\alpha_1) \ln P_t \\ & + (\delta_5 + \delta_6)/(1-\alpha_1) \ln PS_t + (\delta_7 + \delta_8)/(1-\alpha_1) \ln AF_t + (\delta_9 + \delta_{10})/ \\ & (1-\alpha_1) \ln SAF_t + (\delta_9 + \delta_{10})/(1-\alpha_1) \ln A_t + e_t \end{aligned}$$

Income elasticity estimate $\beta_1 = (\delta_1 + \delta_2)/(1-\alpha_1)$;
Price elasticity estimate $\beta_2 = (\delta_3 + \delta_4)/(1-\alpha_1)$;
Price of substitute elasticity estimate $\beta_3 = (\delta_5 + \delta_6)/(1-\alpha_1)$;
Airfare elasticity estimate $\beta_4 = (\delta_7 + \delta_8)/(1-\alpha_1)$;
Substitute Airfare elasticity estimate $\beta_5 = (\delta_9 + \delta_{10})/(1-\alpha_1)$; and
Marketing expenditure elasticity estimate $\beta_6 = (\delta_{11} + \delta_{12})/(1-\alpha_1)$.

The above dynamic modeling approach captures the time-adjustment process within tourism demand modeling by assuming that current tourism demand is not only influenced by the current values of income, price, price of substitutes, airfare, and marketing expenditure but also their past values. Tourism Australia marketing expenditure has long-term effects on tourism demand, but that effect diminishes as time passes. Inclusion of a lagged value of marketing expenditure assumes that current and past advertising expenditures are likely to influence the current demand. The lagged dependent variable is included to capture the "word-of-mouth effect" (Witt, Brooke, and Buckley 1991), which also plays an important role in destination selection. Tourists obtain information about a particular destination from other tourists who have already visited that destination. Furthermore, a lagged dependent variable is included in the tourism demand modeling to capture the repeat visits, indicating that tourists tend to return to the same destination if they enjoyed a previous visit, to avoid risk.

Dynamic models were estimated using the ordinary least square (OLS) methods and are presented in table 2. Only the significant variables are presented here. The income variable does not appear in the estimated Asia tourism demand model because it has the wrong sign, it was not significant, and it was highly correlated with the price variable. The effect of the special events of the Olympic Games and September 11, 2001 were also examined, including dummy variables in the dynamic models, and were not significant at the 5% level. The models shown in table 2 are valid because the adjR^2, the F statistics, and the diagnostic tests for the error terms are generally satisfactory at the 5% level.

The estimated long-run elasticity coefficients from dynamic modeling are presented in table 3. Income elasticity estimates vary between 4.99 and 1.22. The estimated income elasticity suggests that a 1% increase in real income results in a 4.99%, 1.93%, 2.58%, and 1.23% increase in tourist arrivals to Australia from Japan, New Zealand, the UK, and the United States respectively. The estimated high-income elasticity values indicate that international tourism is a luxury item and that it can be influenced by the tourist origin country's economic growth cyclical pattern.

The lagged dependent variable is significant in the dynamic model for Asia, which is included in the tourism demand model to capture the "word-of-mouth effect" and "repeat visits." Asia, Japan, and UK price elasticity estimates are less than unity, implying that changes in price in Australia have less of an impact on tourist arrivals from these countries. Substitute destination price is not significant in the dynamic model, implying that Australia's tourism products are likely to be less substitutable.

Table 4 shows the impact of the marketing expenditure allocation. The marketing expenditure elasticity estimates are less than unity. The estimated marketing expenditure elasticity estimates suggest that a 1% increase in marketing expenditure results in a 0.37%, 0.16%, 0.11%, 0.05%,

Table 2
Estimated Dynamic Models (1980–2005)

Countries	Estimated Dynamic Models (1980–2005)
Asia	$Ln(Q_t) = 0.3303 + 0.8290Ln(Q_{t-1}) - 0.2997Ln(P_t) + 0.3741Ln(A_t)$ (t = 1.2707) (t = 18.3499) (t = –2.4743) (t = 3.1821) AdjR^2 = 0.99 F(3, 21) = 839.58 DW = 1.47 JB(2) = 0.35 LM(1) = 1.79 WH(1) = 1.00 RESET = 0.02
Japan	$Ln(Q_t) = –34.5864 + 4.9894Ln(Y_t) - 0.2300Ln(P_{t-1}) + 0.1595Ln(A_{t-1})$ (t = –12.5632) (t = 13.9223) (t = –2.7705) (t = 3.4573) AdjR^2 = 0.99 F(3, 21) = 1,005.40 DW = 1.58 JB(2) = 0.66 LM(1) = 0.11 WH(1) = 0.66 RESET = 6.01
New Zealand	$Ln(Q_t) = –1.8580 + 1.9324Ln(Y_{t-1}) + 0.1151Ln(A_t)$ (t = –1.2424) (t = 8.2700) (t = 2.0906) AdjR^2 = 0.85 F(2, 22) = 69.28 DW = 1.06 JB(2) = 0.51 LM(1) = 0.01 WH(1) = 0.79 RESET = 4.70
United Kingdom	$Ln(Q_t) = 4.0819 + 2.5820Ln(Y_t) - 0.2357Ln(P_{t-1}) + 0.0468Ln(A_{t-1})$ (t = 11.4563) (t = 13.9724) (t = –3.4433) (t = 1.6783) AdjR^2 = 0.98 F(3, 21) = 385.17 DW = 1.35 JB(2) = 2.08 LM(1) = 0.04 WH(1) = 1.42 RESET = 0.18
United States	$Ln(Q_t) = 0.9442 + 1.2230Ln(Y_t) + 0.1499Ln(A_{t-1})$ (t = 1.3790) (t = 6.6888) (t = 3.4742) AdjR^2 = 0.88 F(2, 22) = 86.47 DW = 0.80 JB(2) = 3.60 LM(1) = 2.59 WH(1) = 0.86 RESET = 5.83

Notes: Q_t: Per capita visitor arrivals; Q_{t-1}: Per capita visitor arrivals in the previous year; Y_t: Per capita income; Y_{t-1}: Per capita income in the previous year; P_t: Price of tourism; P_{t-1}: Price of tourism in the previous year; A_t: Marketing expenditure; A_{t-1}; Marketing expenditure in the previous year. AdjR^2 = Adjusted R^2 statistic; F = F-statistic; DW = Durbin-Watson statistic. Residual Tests: JB(2) = Histogram—normality test; Jarque-Bera test statistic to test for the normality assumption; LM(1) = ARCH LM Test F-statistic (Lagrange multiplier chi-square statistics to test the first order serial correlation); WH(1) = White heteroscedasticity (no cross terms) test F-statistic to test the null of homoscedasticity. Stability Tests: RESET = Ramsey RESET Test F-statistic (chi-square test of functional form).

Table 3
Tourism Demand Elasticity Estimates (1980–2005)

Countries	Q_{t-1}	Y	P	PS	AF	SAF	A	D1	D2
Asia	0.83	—	–0.29	—	—	—	0.37	—	—
Japan	—	4.99	–0.23	—	—	—	0.16	—	—
New Zealand	—	1.93	—	—	—	—	0.11	—	—
United Kingdom	—	2.58	–0.24	—	—	—	0.05	—	—
United States	—	1.22	—	—	—	—	0.15	—	—

Notes: Q_{t-1}: Per capita visitor arrivals in the previous year; Y: Per capita income; P: Price of tourism; PS: Price of tourism in the substitute destination; AF: Cost of transport; AF: Cost of transport to substitute destination; A: Marketing expenditure; D1: Olympic Games; D2: September 11, 2001.

and 0.15% increase in tourist arrivals to Australia from Asia, Japan, New Zealand, the UK, and the United States respectively. They have the expected positive signs confirming our *a priori* expectations.

The results suggest that the international marketing activities of Tourism Australia are playing a positive and statistically significant role in influencing inbound tourism demand to Australia. The results also have policy implications. For a given allocation of resources to international marketing activity some markets indicate greater opportunity than others to generate visitor expenditure in Australia. To compare the potential return from allocating scarce marketing dollars between different markets, the next section introduces a CE analysis.

Cost-Effectiveness Analysis

CE analysis can be used to estimate the "return" in terms of tourism receipts per dollar invested in international tourism marketing to a particular source country (Kulendran and Divisekera 2007). CE analysis is a technique that can be used as a tool for addressing the issues of efficiency in the allocation of scarce resources. The marginal cost of an activity is the difference between the cost of that activity and the cost of doing nothing. The calculation is similar for effectiveness. The final outcome measure for the analysis is the CE ratio, the ratio of marginal effectiveness to marginal cost.

Table 4
The Impact Of Marketing Expenditure Allocation (1980–2005)

Market	Marketing[a] Elasticity	Average[b] Marketing Expenditure (2004–2005) (000)	Average[c] Tourist Arrivals (000)	Marketing[d] Increase by 1% (000)	Arrivals[e] Increase (000)	Tourist[f] Average Expenditure (2006)	Receipts[g] Increase (000)	Effectiveness Cost[h] Ratios (g ÷ d)
Asia	0.37	18,933	406	189.33	1.5022	2,192	3,292.07	17:1
Japan	0.16	15,013	482	150.13	0.7712	1,555	1,199.22	8:1
New Zealand	0.11	2,295	551	22.95	0.6061	1,379	835.81	36:1
United Kingdom	0.05	20,246	358	202.46	0.1790	2,840	508.36	3:1
United States	0.15	14,885	298	148.85	0.4470	2,409	1,076.82	7:1

Source: Authors' estimates.
a. Marketing elasticity from table 2.
b. Average marketing expenditure from 2004–2005.
c. Average tourist arrivals.
d. 1% increase in b.
e. As the result on average c would increase by the percentage of a.
f. Tourist average expenditure.
g. e multiplied by f.
h. g divided by d.

Table 5
Dollar Return Measured In Tourism Receipts Per Dollar Investment

Market	Kulendran and Dwyer (2007)	Crouch et al. (1992)	Access Economics Report (1997)	Access Economics Report (2002)
United States	7:1	9:1	—	—
Japan	8:1	41:1	—	—
United Kingdom	3:1	24:1	—	—
New Zealand	36:1	220:1	—	—
Average	13.5:1	73:1	8:1, 10:1	11:1, 16:1

It is desirable to compare the tourism receipts with respective tourism marketing investment rather than with the number of visitor arrivals because tourist expenditure injection has greater policy significance. Therefore, to obtain the increase in tourist receipts that is the result of Tourism Australia marketing policy, the increase in international visitor arrivals from each source market was multiplied by the average expenditure in Australia by international visitors from that market. The average expenditure of international visitors was obtained from the International Visitor Survey (Tourism Research Australia 2006a).

The marginal effectiveness of the Tourism Australia marketing expenditure is the increase in tourist receipts that arise from every extra dollar spent on tourism marketing. The marginal cost is the increase in expenditure incurred. The calculated CE ratios for Asian countries and the United States, Japan, the UK, and New Zealand are presented in the final column of table 4. The CE ratio indicates that the New Zealand market has the highest return per dollar invested (36:1). The (total) Asia market has the second highest value (17:1) followed by Japan (8:1), the United States (7:1), and the UK (3:1). Thus the estimated tourism receipts generated for each market per $1 million spend on marketing promotion are $17 million, $36 million, $8 million, $7 million, and $3 million for Asia, New Zealand, Japan, the United States, and the UK respectively. The findings indicate that it is most cost effective for Tourism Australia to focus on New Zealand and Asia as an origin market for inbound tourism.

Table 5 compares these estimates with previous studies by Crouch, Schultz, and Valerio (1992) and two studies undertaken by Access Economics (1997, 2002). The Crouch, Schultz, and Valerio estimates are high, possibly reflecting a relatively low level of marketing expenditure in the 1980s combined with Australia's emergence as a globally competitive tourism destination. Access Economics estimated aggregate values ranging between 8:1 and 16:1 depending on the model used. The results of the present study indicate that tourism marketing expenditure by Tourism Australia is associated with higher injected expenditure from the targeted inbound markets. Of the selected markets, New Zealand has the highest CE

ratio (36:1) indicating the expenditure return per dollar of additional marketing activity. The next highest return is that of Asia (excluding Japan) where the estimated dollar return (per dollar invested) in tourism marketing for Asia is 17:1. This indicates that tourism receipts generated from the Asian market (excluding Japan) represent $17 million per $1 million spent on tourism promotion. These measures show that the overall positive impact of tourism marketing expenditure is high because the ratio of tourism marketing expenditure to tourist expenditure return is greater than unity. On average, tourism receipts from the United States, Japan, the UK, and New Zealand represent $13.5 million per $1 million spent on tourism promotion. Again, this indicates that a dollar of marketing activity allocated to Asia gives a better return in terms of injected expenditure than for the established inbound markets taken as a group.

The CE approach is a very useful device for revealing the implications of estimated marketing elasticities for tourism stakeholders. It also has general significance in that it can be applied to any destination following empirical work to estimate marketing elasticities of demand for different origin markets. The CE approach recognizes that the purpose of marketing expenditure is to generate not visitor numbers *per se*, but injected expenditure associated with visitation. It is thus a very useful technique for those destinations that wish to emphasise visitor yield over visitor numbers as the criterion for targeting certain markets rather than others.

Conclusions

This study measured the return from Tourism Australia's marketing investment in New Zealand, the United States, the UK, Japan, and the Asian tourism markets using a CE analysis.

New Zealand is a low-spending market as evidenced by the average low spends per day by tourists compared to all other markets (Asia, Japan, the UK, and the United States). In addition, it is a well-established major market for Australia. The estimated marketing elasticity for New Zealand is 0.11. Given its proximity to Australia, the number of tourist arrivals from New Zealand is very high and this accounts for the high estimated CE ratio (36:1) for this country. This high ratio means that the tourism receipts generated from the New Zealand market are $36 million per $1 million spent on tourism promotion by Tourism Australia. The implication of this finding is that to increase the return from this market New Zealand tourists should be encouraged through different promotion strategies to increase their expenditure in Australia.

Compared to New Zealand, Asia, Japan, the UK, and the United States are high-spending markets. Asia is a growing tourist market for Australia. The estimated marketing elasticity is 0.37, which implies that the Asian market is more responsive to marketing expenditure than all other markets. The estimated CE ratio is 17:1, and this would mean that the tourism receipts generated from Asia represent $17 million per $1 million spent on tourism promotion. This finding presents another important implication for Australia tourism. It implies that the marketing strategy should focus on increasing the number of visitor arrivals from the high-spending markets, such as Asia, Japan, the UK, and the United States to increase the return from marketing campaigns.

It was found that a dollar of marketing expenditure allocated to Asia (comprising Hong Kong, India, South Korea, Malaysia, the Phillipines, Singapore, and Thailand) gives a better return in terms of injected expenditure than for the established inbound markets taken as a group. Data limitations regarding marketing expenditure in each of the countries that make up Asia precluded the estimation of marketing elasticities for each origin country separately. Another limitation is that the estimated return on investment is tied to the marketing expenditure funded only by the peak international marketing body, Tourism Australia. While this marketing effort is supported by funding from private operators, data limitations have compelled us to exclude private sector marketing activity undertaken outside the umbrella of Tourism Australia. Nonetheless, Tourism Australia can expect that a dollar of additional marketing aimed at these countries may generate greater visitor expenditure than a dollar of marketing to traditional tourism source countries. The technique used can be applied in any context where destination managers face the problem of allocating scarce marketing funds to maximize returns to their destination.

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