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# MODELING INTERNATIONAL TOURIST FLOWS TO INDONESIA AND MALAYSIA

By

AMY YIN FEN TAN

B.S., Ohio State University, 1988

M.S., Ohio State University, 1992

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A DISSERTATION

submitted in partial fulfillment of the

requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Hotel, Restaurant, Institutional Management and Dietetics
College of Human Ecology

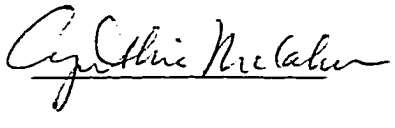
KANSAS STATE UNIVERSITY
Manhattan, Kansas

2000

Approved by:

Co-Major Professor
Dr. Judy Miller

Co-Major Professor
Dr. Cynthia McCahon



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ABSTRACT

The major purpose of this study was to examine the primary factors that influence the flow patterns of tourists to Indonesia and Malaysia. The objectives of the study included: 1) estimating the tourism demand models from six important origin countries (Japan, Singapore, Australia, USA, UK, and Germany) to Indonesia and Malaysia using annual time-series data, and 2) estimating the stability of inbound tourism demand models for Indonesia and Malaysia as a function of increasing government intervention in tourism using panel data. The second objective specifically examined the differences in the estimated parameters before and after formation of an important tourism development organization in the respective destination country.

The basic demand model used to accomplish the objectives is based on the classic demand theory of economics. Therefore, the primary factors examined were income, prices of goods and services, and time-trend. Dummy variables also were included in the models to account for a number of special events (for objective one) and country differences (for objective two). The double-log functional form was chosen to test the data. Ordinary Least Square multiple regression technique was used to estimate the demand models, and only secondary data were used for the analysis.

The findings of the study generally affirm that income, prices, and time-trend were important factors determining tourism demand for Indonesia and Malaysia. However, tourists from the same origin country were found to respond to changes in the factors differently, depending upon the destination country in question. The results also support the hypothesis which postulates that the estimated tourism demand elasticities for Indonesia and Malaysia vary as a function of increasing government intervention. This

study has identified ways for the Indonesian and Malaysian governments to further exploit their tourism sectors through appropriate adjustment in their tourism policies and marketing efforts.

TABLE OF CONTENTS

Page

## LIST OF FIGURES

## LIST OF TABLES

## ACKNOWLEDGEMENTS

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Finally, to my mother and father, I want to express how deeply I appreciate your love and support during the past years. Your encouragement and understanding have made all these possible.

# CHAPTER I

# INTRODUCTION

## Inbound Tourism in Indonesia and Malaysia

### The Role of Government in Tourism

The rapid growth of international tourism over the past three decades has attracted considerable attention in many developing nations, including Indonesia and Malaysia. International tourism not only contributes foreign exchange to the receiving country; it is also an important employment generating activity and a source of income. In Indonesia and Malaysia, the potential of tourism has been recognized by the governments only since the recession of the early 1980's (Liden and Tyler, 1992; Schwarz, 1988). With the respective decreases in oil and commodity prices in Indonesia and Malaysia during the recession, the surge in international tourism in the countries made this industry one of the most positive facets for reviving the nations' economies. Since then, tourism has received tremendous attention from the Indonesian and Malaysian governments.

However, the history of tourism development in Indonesia and Malaysia has not been as a result of organized government intervention until the late 1980s. As has been noted by Witt et al. (1991), governments are usually involved in the stimulation of tourism demand and in managing the supply of tourism services through the formation of various tourist offices in the destination countries. In Indonesia, the Indonesia Tourism Promotion Board (ITPB) created in 1989 is especially important to give the country's tourism more of a push on the international front (Cohen, 1991; Mcbeth, 1994; "Indonesia Handbook", 1999). The primary function of the ITPB is to engage in marketing of the country in order to attract more tourists. These activities include 1)

advertising the country internationally as a travel destination by emphasizing the various general attractions that the country offers to tourists, 2) undertaking appropriate public relations activities, 3) identifying appropriate policies to be pursued through market research, and 4) the provision of appropriate literature and information centers. Thus far, the international marketing campaigns of the country are staged primarily through seven Tourism Promotion Centers in Germany, USA, Japan, Singapore, Australia, UK, and Taiwan ("Indonesia Handbook", 1999). Additionally, the ITPB also assumes the planning role by assessing personnel and training as well as the infrastructure requirements for the tourism industry in Indonesia to a certain extent. Coordinating the national promotional activities that include individual participants in the industry (i.e. airlines and hotels) are also responsibilities of the ITPB.

In Malaysia, the Ministry of Culture, Arts and Tourism (MOCAT) established in 1987, is the most important organization responsible for the overall tourism administration in the country (Anonymous, 1989; Aznam, 1990; Mohamed, 1995; Todd, 1987). Apart from planning, appraisal, and monitoring the implementation and execution of tourism programs and projects, MOCAT also plays an active role in formulating tourism development policies. To further accelerate the development process, MOCAT has been split into three divisions (Planning, Culture, and Administration and Finance) and five agencies (Malaysian Tourism Promotion Board, National Art Gallery, National Museum, National Archives, and National Library). Among these, the Malaysian Tourism Promotion Board (MTPB) plays the most important role in administering tourism development after MOCAT. In an effort to intensify overseas promotion, the MTPB has opened a total of 18 offices in 16 countries, including the UK, Australia,

Germany, Japan, Singapore, USA and Taiwan (Anonymous, 1997; Aznam, 1990; Mohamed, 1995).

Tourism Receipts and Balance of Payments in Travel Accounts

Despite the increasing efforts of the government in Indonesia and Malaysia to develop the tourism sector, the potential economic benefits that could be derived from this industry have yet to be fully realized. Tables 1 and 2 show the relative size of the contribution of international tourism receipts in its capacity as a foreign exchange earner and domestic income generator in both Indonesia and Malaysia, respectively.

From Table 1, it can be seen that tourism receipts in Indonesia were between one and 11 percent of the total exports between 1981 to 1997. In terms of the nation's income, international tourism receipts in Indonesia only accounted for about 0.4 to 3.6 percent of the country's gross domestic product (GDP) in that period. Nevertheless, Indonesia's international travel account has been very favorable since 1986, generating surpluses that could be used as an important source of funds to help offset deficits in other sectors (See Table 3 and Figure 1).

In comparison to Indonesia, the proportion of international tourism receipts relative to the total exports in Malaysia ranged between three to five percent, and these figures fluctuated throughout the period (See Table 2). In relation to the country's income, tourism receipts in Malaysia contributed 1.5 to six percent to the GDP between 1981 to 1997. In contrast to the favorable balance of payments in the Indonesian travel account, Malaysia experienced deficits in its balances from 1981 to 1993, and the trend only has begun to reverse in 1994 (See Table 3 and Figure 2).

Table 1

Contribution of International Tourism Receipts to the Indonesian Economy

| Year | Tourism Receipts (Million of $ US) (1) | Exports of Goods & Services (Million of $ US) (2) | GDP at constant 1990 prices (Million of $ US) (3) | Receipts from international tourism as a % of exports (4) = (1)/(2) x 100 | Receipts from international tourism as a % of GDP (5) = (1)/(3) x 100 |
|---|---|---|---|---|---|
| 1981 | 288 | 25778 | 72363 | 1.11 | 0.40 |
| 1982 | 288 | 22233 | 73988 | 1.30 | 0.39 |
| 1983 | 397 | 21218 | 77091 | 1.87 | 0.51 |
| 1984 | 520 | 23308 | 82467 | 2.23 | 0.63 |
| 1985 | 525 | 21356 | 84499 | 2.46 | 0.62 |
| 1986 | 647 | 17226 | 89518 | 3.76 | 0.72 |
| 1987 | 924 | 20258 | 93870 | 4.56 | 0.98 |
| 1988 | 1283 | 22866 | 99296 | 5.61 | 1.29 |
| 1989 | 1628 | 26838 | 106700 | 6.07 | 1.53 |
| 1990 | 2105 | 31285 | 114427 | 6.73 | 1.84 |
| 1991 | 2522 | 34448 | 122380 | 7.32 | 2.06 |
| 1992 | 3278 | 39179 | 130285 | 8.37 | 2.52 |
| 1993 | 3988 | 42559 | 138749 | 9.37 | 2.87 |
| 1994 | 4785 | 47014 | 149210 | 10.18 | 3.21 |
| 1995 | 5228 | 54918 | 161475 | 9.52 | 3.24 |
| 1996 | 6308 | 58783 | 174361 | 10.73 | 3.62 |
| 1997 | 6589 | 65223 | 182467 | 10.10 | 3.61 |

Note.

1) Tourism receipts were obtained from United Nations Statistical Yearbook (1982 to 1998).
2) Exports of good and services were determined by adding the values for exports of goods and exports of services obtained from International Financial Statistics Yearbook. (1998).
3) GDP at constant 1990 US prices were determined by dividing GDP at constant 1990 Indonesian Rupiah by the 1990 market exchange rate defined in Indonesian currency per US dollar. Figures for GDP and exchange rates were obtained from International Financial Statistics Yearbook (1998).

Table 2

Contribution of International Tourism Receipts to the Malaysian Economy

| Year | Tourism Receipts (Million of $ US) (1) | Exports of Goods & Services (Million of $ US) (2) | GDP at constant 1990 prices (Million of $ US) (3) | Receipts from international tourism as a % of exports (4) = (1)/(2) x 100 | Receipts from international tourism as a % of GDP (5) = (1)/(3) x 100 |
|---|---|---|---|---|---|
| 1981 | 387 | 13068 | 25667 | 2.96 | 1.51 |
| 1982 | 495 | 13649 | 27192 | 3.63 | 1.82 |
| 1983 | 545 | 15655 | 28892 | 3.48 | 1.89 |
| 1984 | 608 | 18453 | 31134 | 3.29 | 1.95 |
| 1985 | 622 | 17185 | 30816 | 3.62 | 2.02 |
| 1986 | 642 | 15636 | 31139 | 4.11 | 2.06 |
| 1987 | 718 | 20150 | 32817 | 3.56 | 2.19 |
| 1988 | 745 | 23359 | 35705 | 3.19 | 2.09 |
| 1989 | 1038 | 27646 | 38983 | 3.75 | 2.66 |
| 1990 | 1667 | 32665 | 42775 | 5.10 | 3.90 |
| 1991 | 1530 | 38086 | 46452 | 4.02 | 3.29 |
| 1992 | 1768 | 44812 | 50074 | 3.95 | 3.53 |
| 1993 | 1876 | 52650 | 54253 | 3.56 | 3.46 |
| 1994 | 3189 | 66217 | 59267 | 4.82 | 5.38 |
| 1995 | 3910 | 83369 | 64871 | 4.69 | 6.03 |
| 1996 | 3926 | 91391 | 70435 | 4.30 | 5.57 |
| 1997 | 3850 | 92897 | 75940 | 4.14 | 5.07 |

Note.

1) Tourism receipts were obtained from United Nations Statistical Yearbook (1982 to 1998).

2) Exports of good and services were determined by adding the values for exports of goods and exports of services obtained from International Financial Statistics Yearbook (1998).

3) GDP at constant 1990 US prices were determined by dividing GDP at constant 1990 Malaysian Ringgit by the 1990 market exchange rate defined in Malaysian currency per US dollar. Figures for GDP and exchange rates were obtained from International Financial Statistics Yearbook (1998).

Table 3

International Travel Accounts

| | INDONESIA | | | MALAYSIA | | |
|---|---|---|---|---|---|---|
| Year | Tourism Receipts (Million of $ US) (1) | Tourism Expenditures (Million of $ US) (2) | Balance (Million of $ US) (3) = (1)-(2) | Tourism Receipts (Million of $ US) (1) | Tourism Expenditures (Million of $ US) (2) | Balance (Million of $ US) (3) = (1) – (2) |
| 1981 | 288 | 644 | -356 | 387 | 678 | -291 |
| 1982 | 288 | 577 | -289 | 495 | 850 | -355 |
| 1983 | 397 | 523 | -126 | 545 | 1047 | -502 |
| 1984 | 520 | 516 | 4 | 608 | 1141 | -533 |
| 1985 | 525 | 591 | -66 | 622 | 1158 | -536 |
| 1986 | 647 | 570 | 77 | 642 | 1669 | -1027 |
| 1987 | 924 | 511 | 413 | 718 | 1234 | -516 |
| 1988 | 1283 | 592 | 691 | 745 | 1306 | -561 |
| 1989 | 1628 | 722 | 906 | 1038 | 1365 | -327 |
| 1990 | 2105 | 836 | 1269 | 1667 | 1450 | -217 |
| 1991 | 2522 | 969 | 1553 | 1530 | 1584 | -54 |
| 1992 | 3278 | 1166 | 2112 | 1768 | 1770 | -2 |
| 1993 | 3988 | 1539 | 2449 | 1876 | 1838 | -38 |
| 1994 | 4785 | 1900 | 2885 | 3189 | 1737 | 1452 |
| 1995 | 5228 | 2172 | 3056 | 3910 | 1791 | 2119 |
| 1996 | 6308 | 2300 | 4008 | 3926 | 2575 | 1351 |
| 1997 | 6589 | 2436 | 4153 | 3850 | 2478 | 1372 |

Note.

Tourism receipts and expenditures were obtained from United Nations Statistical Yearbook (1982 to 1998).

Figure 1

International Travel Accounts in Indonesia

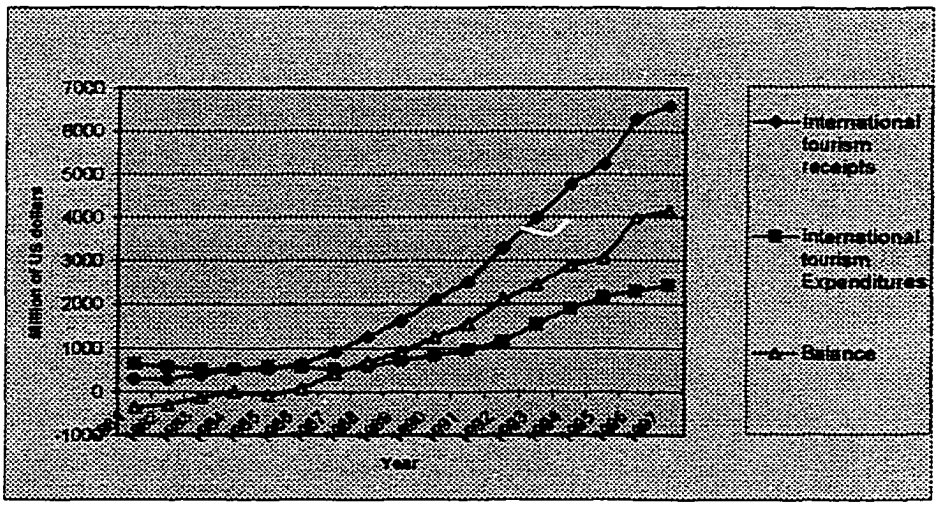
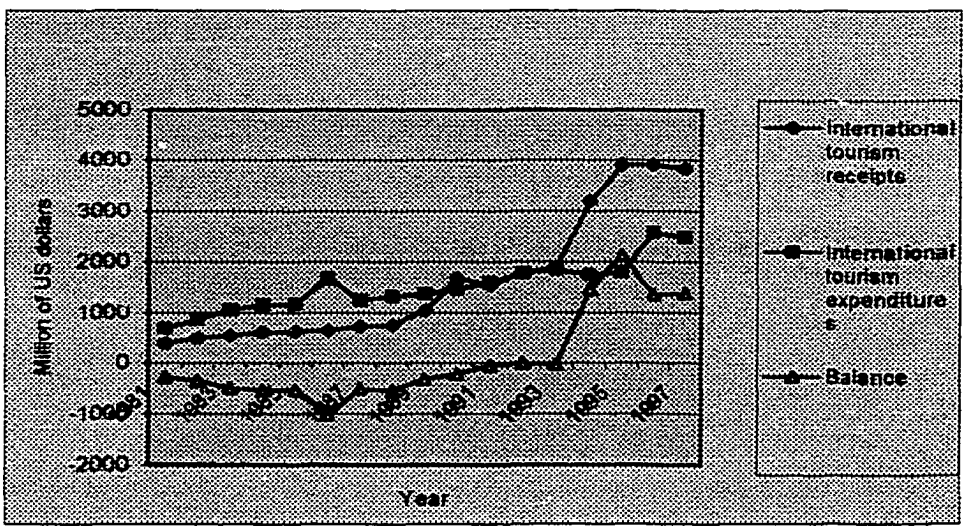



Figure 2

International Travel Accounts in Malaysia



Tourist Arrivals

In general, Indonesia and Malaysia fared well in terms of tourist arrivals for the past two decades. Table 4 gives the total tourist arrivals and the annual growth rates in Malaysia and Indonesia over the past 17 years. Figure 3 illustrates the total tourist arrivals for both destination countries graphically.

As can be seen from Table 4, the number of tourist arrivals in Indonesia grew approximately eight fold, from 600,000 in 1981 to about 5 million in 1997, at an average annual rate of 14.8 percent. Tourist arrivals to Malaysia, on the other hand, increased from 1.6 million to 6.2 million, at an annual rate of 9.5 percent between 1981 to 1997. Despite the seemingly increasing trend in tourist arrivals to Malaysia for the past 17 years, there was indeed tremendous fluctuation in the growth pattern in comparison to Indonesia (See Figure 3).

Several important events in these 17 years have been noted for their influences on tourist flow patterns in Indonesia and Malaysia. The huge surge of tourists in Malaysia in 1990 and 1994 was attributed to its "Visit Malaysia Year" campaigns (Anonymous, 1993; Anonymous, 1997). The substantial effort of the "Visit ASEAN (Association of Southeast Asian Nations) Year 1992" campaign, which was directed at the ASEAN nations themselves (including Brunei Darusallam, Indonesia, Malaysia, Philippines, Singapore, and Thailand) as well as the Australian, German, and Japanese markets was credited for their increases in tourist arrivals to Indonesia and Malaysia in 1992 (Anonymous, 1993; Schansman, 1991). On the other hand, the negative impact of the Gulf War has been cited often as the main reason for the slow growth and drastic drop in the number of visits for both countries in 1991 (Mcbeth, 1994; Schansman, 1991;

Table 4

Tourist Arrivals in Indonesia and Malaysia

| | INDONESIA | | MALAYSIA | |
|---|---|---|---|---|
| Year | Number in Thousand | Percent growth | Number in Thousand | Percent growth |
| 1981 | 600 | - | 1679 | - |
| 1982 | 592 | -1.3 | 2093 | 24.7 |
| 1983 | 639 | 7.9 | 2750 | 31.4 |
| 1984 | 701 | 9.7 | 2779 | 1.1 |
| 1985 | 749 | 6.8 | 2933 | 5.5 |
| 1986 | 825 | 10.1 | 3217 | 3.5 |
| 1987 | 1060 | 28.8 | 3359 | 4.4 |
| 1988 | 1301 | 22.7 | 3624 | 7.9 |
| 1989 | 1626 | 25.0 | 4846 | 33.7 |
| 1990 | 2178 | 33.9 | 7446 | 53.7 |
| 1991 | 2570 | 18.0 | 5847 | -21.5 |
| 1992 | 3064 | 19.2 | 6016 | 2.9 |
| 1993 | 3403 | 11.1 | 6504 | 8.1 |
| 1994 | 4006 | 17.7 | 7197 | 10.7 |
| 1995 | 4324 | 7.9 | 7469 | 3.8 |
| 1996 | 5034 | 16.4 | 7138 | -4.4 |
| 1997 | 5185 | 3.0 | 6211 | -13.0 |

Note.

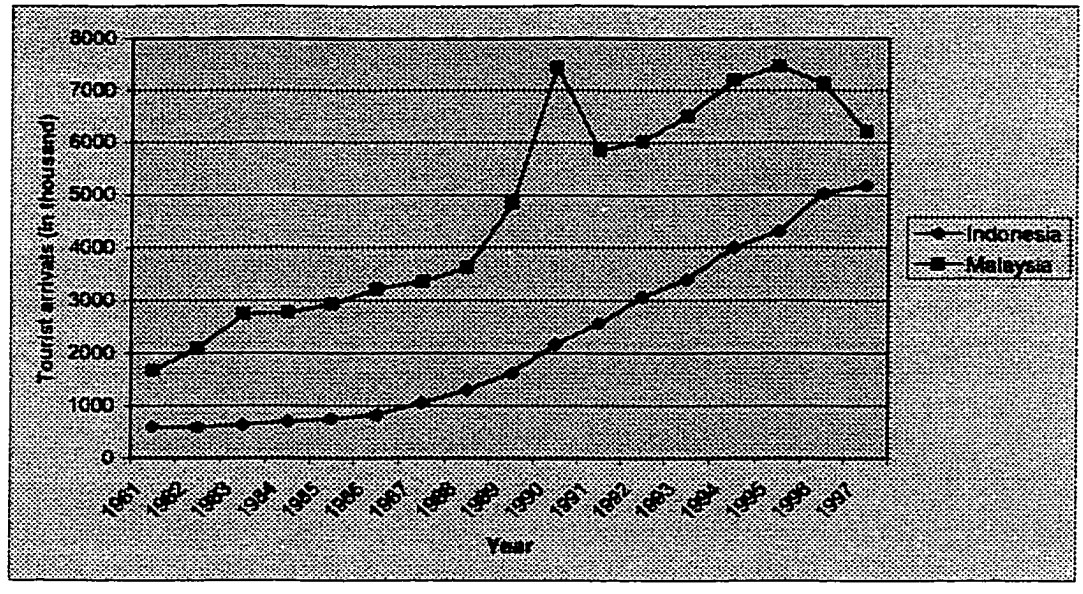
Tourist arrivals were obtained from the following two sources:

1) United Nations Statistical Yearbook (1982 to 1985).

2) World Tourism Organization (1998).

Figure 3

Tourist Arrivals in Indonesia and Malaysia



Selwitz, 1991; Soledad, 1996). In 1997, the tourist industry in Indonesia experienced its first stagnant period in the decade, whereas that in Malaysia experienced a negative growth. This bad performance was attributed to the Asian economic crisis and the outbreaks of forest fires in Indonesia (Leiper and Hing, 1998).

Tourist Markets

Table 5 shows the relative market shares in tourist arrivals according to region. As can be seen from the table, the Asia Pacific region was the biggest tourist supplier for Indonesia and Malaysia between 1985 to 1997, contributing an average of 87 percent and 71 percent of arrivals to Malaysia and Indonesia, respectively. Among all countries in Asia, Singapore and Japan were the leading suppliers of tourists to both countries in that period. Together with the United Kingdom (UK), Germany, Australia, and the United States of America (USA), they have contributed over 50 percent of Indonesia's and Malaysia's tourists throughout the period (See Tables 6 and 7). With the recent decline in regional international travel as a result of the Asian economic downturn, long-haul markets such as the USA, UK, and Germany have grown to become more important for both destinations. These tourist-generating countries are more likely to be the primary sources of supply of "hard" currencies for reforming the Indonesian and Malaysian economies in the near future.

Table 5

Market Shares in Tourist Arrivals Classified by Regions

| INDONESIA | | | | MALAYSIA | | | |
|---|---|---|---|---|---|---|---|
| Year | Asia Pacific | Americas | Europe | Year | Asia Pacific | Americas | Europe |
| 1985 | 64.2 | 9.4 | 24.1 | 1985 | 88.4 | 1.9 | 5.1 |
| 1986 | 62.7 | 9.3 | 25.3 | 1986 | 87.3 | 1.4 | 3.8 |
| 1987 | 65.8 | 7.2 | 25.1 | 1987 | 87.1 | 1.5 | 3.9 |
| 1988 | 67.6 | 6.3 | 24.7 | 1988 | 86.5 | 1.6 | 4.2 |
| 1989 | 69.0 | 5.7 | 23.3 | 1989 | 87.8 | 2.1 | 5.8 |
| 1990 | 70.5 | 5.8 | 22.2 | 1990 | 87.0 | 2.4 | 6.1 |
| 1991 | 75.0 | 5.0 | 18.7 | 1991 | 85.0 | 2.3 | 7.2 |
| 1992 | 75.1 | 5.2 | 18.3 | 1992 | 88.3 | 1.9 | 5.7 |
| 1993 | 73.2 | 5.6 | 19.4 | 1993 | 89.9 | 1.8 | 5.7 |
| 1994 | 72.9 | 5.3 | 19.9 | 1994 | 89.2 | 1.8 | 5.6 |
| 1995 | 74.3 | 4.7 | 18.4 | 1995 | 89.2 | 1.8 | 5.4 |
| 1996 | 78.2 | 4.9 | 15.0 | 1996 | 88.8 | 2.0 | 5.7 |
| 1997 | 67.5 | 4.3 | 13.7 | 1997 | 74.0 | 2.2 | 6.2 |

Note.

1) All figures were calculated in percent share.

2) Tourist arrivals from each region were obtained from the following sources: United Nations Statistical Yearbook (1986 to 1990) and World Tourism Organization (1998).

Table 6

Market Shares in Indonesian Tourist Arrivals Classified by Country of Origin

| Year | Singapore | Japan | Australia | USA | UK | Germany | Total |
|---|---|---|---|---|---|---|---|
| 1985 | 19.0 | 11.9 | 16.4 | 7.8 | 4.9 | 4.2 | 64.3 |
| 1986 | 18.6 | 12.5 | 14.8 | 7.9 | 5.1 | 4.5 | 63.5 |
| 1987 | 22.9 | 12.7 | 12.6 | 6.1 | 4.6 | 4.7 | 63.6 |
| 1988 | 26.7 | 12.1 | 11.4 | 5.2 | 4.8 | 4.5 | 64.7 |
| 1989 | 27.7 | 12.0 | 10.0 | 4.6 | 4.8 | 4.4 | 63.5 |
| 1990 | 28.5 | 12.1 | 8.2 | 4.7 | 4.2 | 4.0 | 61.7 |
| 1991 | 27.7 | 11.3 | 8.5 | 3.9 | 3.9 | 3.7 | 59.1 |
| 1992 | 26.4 | 12.9 | 7.7 | 4.1 | 3.8 | 3.9 | 58.7 |
| 1993 | 25.2 | 11.1 | 8.5 | 4.5 | 3.9 | 3.9 | 57.1 |
| 1994 | 25.4 | 11.9 | 7.6 | 4.2 | 4.1 | 4.0 | 57.2 |
| 1995 | 24.2 | 11.2 | 7.4 | 3.6 | 3.8 | 3.9 | 54.2 |
| 1996 | 25.8 | 13.2 | 7.6 | 3.9 | 2.9 | 3.3 | 56.8 |
| 1997 | 26.1 | 12.3 | 8.8 | 3.5 | 3.3 | 3.6 | 57.7 |

Note.

1) All figures were calculated in percent share.

2) Tourist arrivals from each origin country were obtained from World Tourism Organization (1998).

Table 7

Market Shares in Malaysian Tourist Arrivals Classified by Country of Origin

| Year | Singapore | Japan | Australia | USA | UK | Germany | Total |
|---|---|---|---|---|---|---|---|
| 1985 | 70.9 | 4.0 | 2.7 | 1.4 | 2.2 | 0.8 | 81.9 |
| 1986 | 67.0 | 4.1 | 2.6 | 1.4 | 2.5 | 0.9 | 78.6 |
| 1987 | 66.1 | 4.2 | 2.7 | 1.5 | 2.6 | 0.9 | 77.9 |
| 1988 | 64.3 | 4.5 | 2.7 | 1.6 | 2.8 | 0.9 | 76.7 |
| 1989 | 64.9 | 4.3 | 1.6 | 1.6 | 2.3 | 1.0 | 75.6 |
| 1990 | 61.4 | 6.8 | 2.0 | 2.0 | 2.6 | 1.0 | 75.7 |
| 1991 | 55.8 | 6.9 | 2.1 | 1.8 | 2.9 | 1.1 | 70.5 |
| 1992 | 62.2 | 4.3 | 2.0 | 1.3 | 2.4 | 0.8 | 73.0 |
| 1993 | 62.3 | 3.9 | 1.9 | 1.3 | 2.4 | 0.9 | 72.7 |
| 1994 | 62.1 | 4.0 | 1.8 | 1.3 | 2.2 | 1.0 | 72.3 |
| 1995 | 60.7 | 4.4 | 1.8 | 1.3 | 2.2 | 0.9 | 71.4 |
| 1996 | 58.2 | 4.9 | 2.1 | 1.4 | 2.3 | 0.9 | 69.9 |
| 1997 | 56.2 | 5.0 | 2.1 | 1.5 | 2.6 | 0.9 | 68.3 |

Note.

1) All figures were calculated in percent share.

2) Tourist arrivals from each origin country were obtained from World Tourism Organization (1998).

## Problem Statement & Significance of the Study

The rapid growth of global tourism over the past three decades has intensified the competition among various destinations to attract tourists. Being late comers into the industry, Indonesia and Malaysia face a great deal of competition, particularly with two neighboring countries, Singapore and Thailand, in order to obtain a share of this market. Despite the interest and attention given to international tourism in Indonesia and Malaysia, the potential economic benefits that could be derived from this industry have not been fully realized. This is evidenced from the relatively low contribution of the tourism receipts to the countries' exports and income levels for the past two decades. In view of this disparity, the fierce competition in the tourism industry, and the many opportunities presented by this rapidly growing sector of the global economy, factors that affect international tourists' demand for Indonesia and Malaysia deserve immediate attention. Additionally, the fact that the tourism industry can be the most rapid factor for reforming the Indonesian and Malaysian economies (by supplying the 'hard' currencies) after the recent recession as a result of the Asian currency crisis has further prompted the need to examine this issue in more depth.

To the knowledge of this author, there is no empirical study that has estimated the relative effect of the determinants of demand for Indonesian and Malaysian tourism. The estimation of such factors is of paramount importance for the governments in both destinations to make adjustment in their marketing strategies and tourism policies accordingly. This study also has important implications for the Indonesian and Malaysian governments to manage the supply of tourism products and services in their respective country.

## Purpose, Objectives, and Hypotheses of the Study

The main purpose of this study was to examine the factors that influence the flow patterns of tourists to Indonesia and Malaysia using a regression analysis technique. Six important tourist-generating countries were examined: Singapore, Japan, Australia, USA, UK, and Germany. The two primary objectives of the study were:

1) To estimate the tourism demand models for Indonesia and Malaysia individually, from each of the six tourist-generating countries using time-series data.

2) To estimate the stability of respective inbound tourism demand models for Indonesia and Malaysia as a function of increasing government intervention in tourism using panel data. This objective specifically examined the differences in the estimated parameters before and after formation of an important tourism development organization in each destination country.

The econometric approach has been one of the most popular methods for modeling the determinants of international tourism demand (more will be addressed in Chapter II). This is because the theoretical framework for this type of study rests heavily upon the principles of demand in economics. Hence, the basic model formulated is primarily concerned with the most relevant economic determinants, and the following specific null hypotheses were tested for each destination country:

Hypothesis 1a: Tourist arrivals to Indonesia (Malaysia) from each of the six origin countries were not responsive to changes in income.

Hypothesis 1b: Tourist arrivals to Indonesia (Malaysia) from each of the six origin countries were not responsive to changes in destination prices.

Hypothesis 1c: Tourist arrivals to Indonesia (Malaysia) from each of the six origin countries were not responsive to changes in currency exchange rates.

Hypothesis 1d: There was no change of preferences among tourists to Indonesia (Malaysia) from each of the six origin countries during the estimation period.

Hypothesis 1e: Tourist arrivals to Indonesia from each of the six origin countries were not responsive to the following special events: i) Persian Gulf War, ii) Visit ASEAN Year campaign, and iii) forest fires and the Asian currency crisis.

Hypothesis 1f: Tourist arrivals to Malaysia from each of the six origin countries were not responsive to the following special events: i) Persian Gulf War, ii) Visit ASEAN Year campaign, iii) forest fires and the Asian currency crisis, and iv) Visit Malaysia Year campaigns.

Hypothesis 2: There was no difference in the pattern of inbound tourism demand for Indonesia (Malaysia) before and after formation of the Indonesian Tourism Promotion Board (the Ministry of Culture, Arts, and Tourism).

## Limitations of the Study

1. The study was concerned primarily with the responsiveness of international

tourists toward changes in a limited number of economic variables, which have been noted frequently as the most important determinants for tourist demand models. The development and testing of new hypotheses were beyond the scope of this study.

2. The study only included six tourist-generating countries for Indonesia and Malaysia. However, these origin countries accounted for over 50 percent of total tourist arrivals to both destinations between 1985 to 1997.

3. Tourist demand in the study was examined from the perspective of the number of visits only. The responsiveness of tourist expenditures toward changes in the determinants was not included in this study due to the difficulty in obtaining such data.

4. The analysis of the study relied solely on secondary data. Hence, it was assumed that the data extracted from various sources were collected properly and recorded accurately.

5. The findings of this study could be generalized only to the origin and destination countries and the time period under consideration. However, the methodology used can be easily updated for future estimating and forecasting purposes.

## Definitions of Terms

### Tourism Demand

In economic studies, demand is commonly defined as the quantity of the product purchased (Crouch, 1994). In the context of international tourism, demand is often measured in terms of monetary values (i.e., tourism receipts and expenditures) or visitor numbers (i.e., arrivals and departures). Specifically, this study has used international tourist arrivals as the indicator of tourism demand. According to the standard definition

adopted by the United Nations and the World Tourism Organization, "international visitor" refers to "any person who travels to a country other than that in which he/she has his/her usual residence for a period not exceeding 12 months and whose main purpose of visit is other than the exercise of an activity remunerated from within the country visited." International visitors are divided further into tourists and same-day visitors. "Tourist" is defined as "an international visitor who stays at least one night in a collective or private accommodation in the country visited." This standard definition of "tourist" does not include the following: 1) same-day visitors (do not spend the night), 2) immigrants, 3) residents in a frontier zone, 4) person domiciled in one country or area and working in an adjoining country or area, 5) members of the armed forces, diplomats, and consular representatives when they travel from their country of origin to the country in which they are stationed and vice versa, and 6) persons in transit who do not formerly enter the country through passport control.

Tourism Industry or Tourism Sector

The goods and services demanded by tourists do not originate in a single, identifiable industry or sector of the economy but rather in a number of them. Middleton (as cited by Witt et al., 1991) has broken down these sectors into accommodation, transport, travel organizers, attractions, and the destination organization sector. This terminology has been complicated further by the fact that the output of the "tourism industry" is not consumed only by foreign tourists, but is also partially consumed by domestic tourists and the population at large. Due to this complexity, this study has used the term "tourism industry or sector" to refer to "all branches of the economy whose

production (of goods and services) is geared to meet the demand of both international visitors and domestic tourists" (Kanellakis, 1975, p.10). This definition is consistent with the term used in Guidelines for Tourism Statistics developed by the United Nations (as cited in Kanellakis, 1975).

Elasticity of Demand

It refers to the percentage change in quantity demanded resulting from a percentage change in the independent variable. Demand is said to be elastic when the percentage change in quantity is greater than the percentage change in the independent variable (elasticity is greater than one). On the other hand, demand is said to be inelastic when the percentage change in quantity is less than the percentage change in the independent variable (elasticity is less than one). An elasticity equals to one is said to be unitary. In other words, the percentage change in quantity is the same as the percentage change in the independent variable.

Cross-price elasticity

Cross-price elasticity is the percentage change in quantity demanded resulting from a percentage change in the prices of other commodities. Commodities can be either complements or substitutes. Complementary commodities are goods that are consumed jointly, and have negative cross-price elasticities. Substitute commodities, on the other hand, are similar goods that can easily replace one another and have positive cross-price elasticities. In this study, cross-price elasticity was examined in the context of prices of the destination country as relative to prices in the origin country, allowing only the

substitution between the destination country under consideration and the domestic tourism in the origin country.

Gross Domestic Product (GDP)

An indicator of a country's total income earned domestically including the income earned by foreign owned factors of production.

Consumer Price Index (CPI)

An indicator of inflation which reflects changes in the cost of acquiring a fixed basket of goods and services by the average consumers.

Inferior good

A good that consumers purchase less of when their income rises, all other things remaining constant. The commodity under consideration is an inferior good if the income elasticity is less than zero (negative).

Normal good

A good that consumers purchase more of when their income rises, all other things remaining constant. The commodity under consideration is a normal good if the income elasticity is greater than zero (positive). When the income elasticity is greater than one, the commodity is known as a luxury good.

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# CHAPTER II

## LITERATURE REVIEW

A substantial number of empirical studies that attempted to estimate the demand for international tourism have been conducted over the last three decades. A majority of these studies were related to both the inbound and outbound tourism of developed countries, notably in the regions of North America and Europe. Frequently, the demand for international tourism was examined from the perspective of a particular country or region. Most researchers used time-series data to model the travel demand for a single origin country and destination country, while some modeled the aggregate inbound (outbound) travel from (to) either the rest of the world or specific regions of the world. Only a few studies examined the pattern of foreign travel demand cross-sectionally or used panel data (a combination of time-series and cross-section data).

A review of these previous empirical studies also demonstrated the dominant use of regression analysis techniques. Regression analysis provides the most suitable, rigorous method for the estimation of the relationship between several independent variables and a single dependent measure. In the context of international tourism, three types of regression modeling were found commonly (Crouch, 1994a; McGuire, 1989): 1) an econometric model that focuses on the analysis of the impact of economic influences on demand; 2) a gravity model that adopts a geographic perspective with an emphasis on mass (i.e., population) and distance considerations; and 3) a trip generation model that consists of a combination of the other two types (a complex form of gravity model), but with an emphasis on the influence of distance. In the past, the gravity model has been criticized for its absence of a sound theoretical underpinning and its overemphasis on the

distance influence, which may not always be an accurate measure for tourism demand (McGuire, 1989). On the other hand, the econometric approach was the most popular method for studies seeking to determine the relationship between international travel demand and its determinants over time. Hence, the measures of economic factors (e.g., income and price) dominated the research history (Crouch, 1994a; McGuire, 1989), and some studies even found the economic factors to account for most of the variation in tourist numbers and expenditures (Crouch, 1996).

However, an important criterion for the selection of appropriate independent variables for an international travel demand model rests on the type of tourism involved. Travel can take place for a number of reasons; examples are vacations, business, visits to friends and relatives, and pilgrimages (Witt and Witt, 1995). A majority of the previous studies focused on vacation trips. Hence, the following review concentrates only on the demand models using an econometric approach for vacation tourism.

It is important to note that the empirical results of previous econometric models often were viewed in terms of elasticity of demand, which is defined as the percentage change in the quantity of tourism demand with respect to a percentage change in each of the demand determinants. When the elasticity is greater than one, the demand is known as elastic. It implies that the demand for tourism services responds more than proportionally to changes in the independent variable. On the other hand, when the elasticity is less than one, demand is known as inelastic. It implies that the demand for tourism services responds less than proportionally to changes in the independent variable.

## Potential Determinants of International Tourism Demand

### Income

The study of the effects of income and price has dominated past modeling of foreign travel demand, because economic theory suggests the vital roles of both in demand functions. Following the basic principle of demand, the relationship between the quantity demanded for a good or service and income can be either positive or negative, depending upon the type of good or service under consideration (normal or inferior). Consumers will buy more (less) of a (an) normal (inferior) good when there is a surge in their income. Tourism, however, is considered frequently as a normal good (Mohammad, 1993). Hence, with the increases in origin country income, the quantity of tourism services taken is expected to increase, holding all other factors constant.

The income variable usually was included in tourism demand functions in per capita form to correspond to the per capita demand specified. The appropriate measure of the income variable depends largely upon the type of tourism under consideration. Private consumption or personal disposal income has been suggested for measuring vacation visits or visits to friends and relatives, while a more general income such as national income should be used if the focus is on business visits (Witt and Witt, 1995). However, a review of the literature indicated that gross national product (GNP) and gross domestic product (GDP) also were used frequently in the demand functions related to vacation visits (Di Matteo and Di Matteo, 1993; Hui and Yuen, 1996; Jud and Joseph, 1974; Lee, 1996; Mak and White, 1992; Uysal and Crompton, 1984). Qiu (1992), who modeled the inbound vacation demand for Canada, found that both GDP and GNP were good measures of income in the study.

In previous studies of international travel demand, income always was cited as the single most important variable that provided the greatest explanatory power (Anastasopoulos, 1989; Covington et al., 1994; Crouch et al., 1992; Hui and Yuen, 1996; Jud and Joseph, 1974; Kwack, 1972; Lee, 1996; Loeb, 1982; Uysal and Crompton, 1984). The estimated income elasticities of demand commonly were found to be positive and above unity (greater than one) (Crouch, 1994b). The findings therefore rendered most researchers to conclude that foreign travel is a luxury good, an item that rises more than proportionally with increases in income. Occasionally, a negative income elasticity was observed which denoted inferior tourism destinations (Chadee and Mieczkowski, 1987). In terms of the magnitude, there was evidence which indicated that the income elasticity tends to be greater when the dependent measure is in monetary values (i.e. expenditures or receipts) instead of the number of visits (i.e. arrivals or departures) (Crouch, 1996).

Price

Price is another important factor that was incorporated frequently into the travel demand functions. The decision on an appropriate form of price in the context of international tourism demand remains unresolved, albeit it has appeared in the literature as: 1) the price of goods and services in the destination country, 2) the effect of exchange rate changes on purchasing power, and 3) the transportation costs between countries (Crouch, 1994c; O'Hagan and Harrison, 1984; Witt and Witt, 1992).

Destination prices. In basic economic demand theory, the price of a good or service is inversely related to the quantity demanded by consumers. In the context of foreign travel demand, as the prices of goods and services in a destination country

increase, tourists are expected to take fewer visits to the destination, other things remaining constant.

In addition to the prices of goods and services in a particular travel destination, tourists' demand for that country may be a response to changes in the prices of other alternative destinations (cross-price elasticity of demand). As noted by Gray (1966, p.86), "For many travelers....higher than expected prices in one country may result in a change of destination rather than in a decision to forego overseas travel". Nevertheless, some destinations may be complements rather than substitutes. In other words, international travelers may package two or more destinations together and consider them as a single 'product' rather than alternative vacation destinations. It has been suggested that closer destinations are more likely to be complementary (Crouch, 1994b). Additionally, the effect of cross-price may also be examined by including prices of other goods and services, particularly of a luxury nature, that compete for a share of the consumption expenditure (Crouch, 1994b). However, this practice was rarely adopted by past studies due to the limited data available and the fact that the resulting models would be intractable.

In typical travel demand models, the cross-price effect was accounted for by expressing the destination price variable in relative form. Relative prices often were specified as follows: 1) a ratio of prices in the destination to prices in the origin country, and/or 2) a ratio of prices in the destination to prices in substitute destination(s). The former definition merely allows the substitution between the destination under consideration and the domestic tourism in the origin country (Martin and Witt, 1988). When the latter definition was employed, a single alternative destination was used

occasionally (Kanellakis, 1975). In cases where the destination prices were compared to the prices in more than one alternative countries, a weighted average of prices (a composite index) usually was constructed for a selected set of competing destinations for the origin country under consideration (Artus, 1972; Jud and Joseph, 1974; Martin and Witt, 1988; Witt and Martin,1987a; Stronge and Redman, 1982). The weighted average index was derived commonly based upon the relative market shares of the alternative destinations for the origin country either using a specific year or as an average over several years.

Despite the widespread practice of using relative prices to model international travel demand equations, separate variables representing the destination prices (to measure the own-price effect) and the substitute prices (to measure the cross-price effect) in absolute terms were employed occasionally (Chadee and Mieczkowski, 1987; Martin and Witt, 1988). Martin and Witt (1988, p.257) noted that "if the real costs of holidays fall, but the relative costs of different holidays remain constant, demand would still be expected to increase." Therefore, the authors believed that the changes in the absolute costs of vacations are just as important as the changes in the relative prices.

The estimation of price elasticities of tourism demand in past studies was further complicated by the selection of a suitable destination price measure. Ideally, a tourist price index or a similar index defined over all goods purchased by tourists is preferable, but such data often are not available for most countries. Hence, a consumer price index (CPI) was used instead as a proxy measure in most studies (Crouch et al., 1992; Lee, 1996; Rosensweig, 1986; Stronge and Redman, 1982; Uysal and Crompton, 1984; Vogt and Wittayakorn, 1998). Martin and Witt (1987) who compared the explanatory power

of a tourist price index and the CPI concluded that, there is no evidence of clear superiority of the former variable, but the CPI is a reasonable proxy for the cost of tourism.

It is evident that the number of ways in which price can be defined in an international tourism demand model is very large indeed. Therefore, the relationship between tourism demand and the price variable depends on the price definition specified in a model. When the price variable is expressed in relative form and as a ratio of prices in the destination to prices in the origin country, the price elasticity is likely to have a negative sign (Crouch et al., 1992; Jud and Joseph, 1974; Lee, 1996). However, Crouch (1992) noted that a positive price elasticity is sometimes possible if the destination prices remain constant while the origin prices vary, particularly if the prices are measured by the CPI. His argument was based on the fact that changes in the origin prices may have a significant impact on real incomes in the origin country, therefore causing the income effect to dominate the substitution effect. Consequently, although destination prices may have declined relative to origin prices, demand for travel to the destination country may decline due to lower real incomes. Similarly, when the price variable is expressed as a ratio of prices in the destination to prices in the alternative destination(s), the price elasticity of demand can be either negative or positive (Crouch, 1992). If the prices in the destination under consideration vary while the prices in the alternative destination(s) remain constant, regardless of whether the alternation destination(s) is a substitute or a complement, the price elasticity is likely to be negative. On the other hand, if the prices in the destination remain constant while the prices in the alternative destination(s) vary, demand for travel to the destination under consideration and the price ratio is likely to be

1) negatively correlated given that the alternative destination is a substitute, and 2) positively correlated given that the alternative destination is a complement. When the price definition involves prices measured in absolute terms, the own-price elasticity ought to exhibit a negative sign, while the cross-price elasticity is expected to be positive in the case of substitutes, and negative in the case of complements (Crouch, 1992; Witt and Witt, 1992).

However, the findings for the effect of destination prices upon foreign travel demand varied widely. The variable was significant in many cases (Artus, 1972; Jud and Joseph; 1974; Kwack, 1972; Little, 1980; Loeb, 1982; Martin and Witt, 1988; Uysal and Crompton, 1984), but several studies found an unexpected sign and statistically insignificant values (Crouch, 1994c). Similar to the income variable, tourism demand defined in the number of visits also was found to be less price sensitive than that defined in monetary values (Crouch, 1996).

Exchange rates. There is still much uncertainty as to the impact of including exchange rates as an independent variable in an international tourism demand model. As noted by Gray (1966, pp.120-121), "the relationship between changes in national price levels and their potential offset by changes in currency values and the joint impact of these phenomena on patterns of tourist expenditure are not yet fully understood." However, certain researchers also argued that although exchange rates do reflect relative rates of inflation to a certain extent in the long run, it may also exert a profound impact on foreign travel demand in the short-term (Gray, 1966; O'Hagan and Harrison, 1984; Witt and Witt, 1992). The reason is that the rapid changes in exchange rates are perceived more readily by potential foreign travelers than changes in the country's price

levels. Hence, the former is used as a proxy variable for the cost of living in the destination.

Conceptually, a depreciation of a destination country's currency relative to an origin country's currency is translated as an increase in the origin country's purchasing power. Hence, the destination country is perceived as more economically attractive and increasing demand is expected, all other factors remaining constant. In reality, however, a seemingly more attractive exchange rate in a destination often is counterbalanced by a surge of inflation, which ultimately may dampen the benefit perceived (Economist Intelligence Unit, 1975; Martin and Witt, 1987; Rosensweig, 1986).

In the past, the effect of exchange rate changes often was accounted for indirectly by converting the destination price variable (either a tourist price index or an equivalent measure such as the CPI) into the currency of the tourist-generating country (Jud and Joseph, 1974; Kliman, 1981). However, the recent practice was to include exchange rate as a separate independent variable (Crouch, 1994b). Martin and Witt (1987) evaluated the relative effectiveness of the CPI and/or exchange rates in explaining the travel demand for a number of European countries. They found that exchange rate was a relevant factor for foreign travel demand, but it was not an acceptable proxy measure for destination's cost of living on its own. Therefore, in models where CPI was used but the exchange rate variable was omitted, the consequence was an upward bias on the estimated coefficient of the CPI factor. On the other hand, Chadee and Mieczkowski (1987) claimed that the exchange rate variable is an equivalent measure of the changes in destination prices, and the inclusion of both may lead to serious statistical problems.

Unlike the destination price variable where the effect of cross-price may be prevalent, Witt and Witt (1992) suggested that a weighted average substitute exchange rate variable is unnecessary. This was justified on the grounds that the potential travelers are unlikely to be sophisticated enough to consider any measure of costs in competing destinations if they are concerned only of the movements of the exchange rates.

Similar to the destination prices, the findings for the effect of exchange rates upon foreign travel demand differed considerably. In certain studies, international tourism demand was found to be highly exchange rate elastic (Gerakis, 1965; Hui and Yuen, 1996; Lin and Sung, 1983; Rosensweig, 1986), whereas others found the effect to be only modest or small (Chadee and Mieczkowski, 1987; Summary, 1987).

Travel cost. The cost of travel from an origin country to a destination country is another important element of price that is expected to influence the demand for international travel. An increase in travel cost is expected to result in a decline in international travel, holding other factors constant.

Previous studies that attempted to examine travel cost as a determinant for tourism flows were concerned mainly about the costs of travel by air between origin and destination major cities. Such costs usually were represented by any of the following: the cheapest fare, economy fare, discount fare, excursion rate, and yield per passenger mile (Covington et al., 1994; Jud and Joseph, 1974; Kliman, 1981; Summary, 1987; Witt and Witt, 1992). Tremblay (1989) claimed that the defined travel cost variable is a reasonable proxy for changes in energy prices, technology, and distance between countries. Witt and Witt (1992) also advocated the possible cross-price effect in travel costs, but little attention was paid to this aspect in the literature.

Similar to the specification of the destination price variable, substantial difficulties were noted for measuring travel costs in past studies. The problems often stemmed from the following reasons (Jud and Joseph, 1974; Kliman, 1981; Stronge and Redman, 1982; Tremblay, 1989; Uysal and Crompton, 1984): 1) inconsistency and lack of travel cost data; 2) the complexity of the transportation cost structure, which often differs in terms of modes, types, classes, and seasons; and 3) the problem of multicollinearity. Multicollinearity between travel cost and income in the demand models often forced previous researchers to either drop the variable (Loeb, 1982; Uysal and Crompton, 1984; Witt and Martin, 1987b) or to yield insignificant results (Gray, 1966; Jud and Joseph, 1974; Stronge and Redman, 1982).

Results regarding the impact of travel cost upon tourism demand were very uncertain. The variable was found to be significant in some studies (Covington et al., 1994; Jud and Joseph, 1974; Kliman, 1981) and insignificant in others (Gray, 1966; Little, 1980).

As mentioned earlier, many studies in the past have failed to include travel costs in the demand functions because of data difficulties and the problem of multicollinearity. The exact consequences of omitting travel cost in a demand model remains inconclusive. Jud and Joseph (1974) who examined the inbound tourism of Latin America found that such an omission led to an upward bias of 10 to 18 percent in the estimated income elasticity of demand in the region. On the other hand, Crouch (1996), who integrated a large number of tourism demand studies through the application of meta-analysis, concluded that the omission of the travel cost variable generally did not significantly influence the estimated income and price elasticities of demand.

Marketing

Promotional activities conducted by destination country in the tourist-generating nations are expected to exert a positive impact on the demand for travel services. However, previous studies of international tourism demand that have included the marketing variable are still relatively limited (Crouch et al., 1992; Lee, 1996; Witt and Martin, 1987c; Uysal and Crompton, 1984). For studies that attempted to examine this effect, total promotional expenditure spent by national tourist offices of destination countries was commonly used as a proxy variable. Such promotional efforts are destination specific and are therefore more likely to have considerable impact on the tourist flows to the destination concerned (Witt and Martin, 1987c).

Although the importance of marketing expenditure as a determinant of tourism demand has been widely recognized, past studies often failed to include the variable because of three reasons (Crouch, 1994b; Tremblay, 1989; Witt and Martin, 1987; Witt and Witt, 1992): 1) the difficulty in obtaining the relevant data; 2) the variable is being highly correlated with the income variable; and 3) the promotional effectiveness in influencing the level of international tourism demand may vary across media, which further complicates its measurement.

Marketing elasticities in past tourism demand models often had the expected positive sign, but whether its impact was significant varied from case to case. For instance, Uysal and Crompton (1984) and Lee (1996) concluded that the marketing activities conducted by the Turkish and Korean governments only exerted minimal impact on international tourist flows to the respective destination countries. Summary (1987) also found the promotional expenditure variable to be less important in affecting

tourist flows to Barbados. Crouch et al. (1992), on the other hand, found the estimated best-fit marketing elasticities in Australia to be statistically significant for the five origin countries examined. In general, in all studies that obtained a significant positive result for the marketing variable, the estimated elasticities were very low (Crouch et al., 1992; Lee, 1996; Uysal and Crompton, 1984; Witt and Martin, 1987c).

Trend

The demand for vacation destinations is subject to changes in the popularity of the destination over time as a result of changing tastes and preferences. For instance, international travel to and originated from the Oceanic region seems to have become increasingly popular, while there seems to be a decline in the popularity of Europe (Crouch, 1995). Hence, some of the past studies have attempted to account for this factor by incorporating a time-trend in the demand function. The time-trend factor also intends to capture the changes in social and cultural interests, attitudes, leisure importance, and all time effects of other explanatory variables not explicitly included in the demand function (i.e., changes in air service frequencies) (Tremblay, 1989; Witt and Witt, 1992). However, some researchers have argued against the inclusion of a time-trend term, due mainly to its collinearity with other causal factors that varied consistently with time, the most notable being the income variable (Crouch, 1994b).

The coefficient of the trend variable is positive when the destination investigated gains popularity over the period, and negative when it loses popularity. Crouch et al. (1992) found the variable to have little measurable effect on international travel demand. Other conclusions, however, varied from weak to moderately strong (Crouch, 1994b).

Special events

The effect of special events that might have had a transitory influence on demand, yet qualitative in nature, was often accounted for by dummy variables. A dummy variable takes the value one when the event in question is expected to influence tourism demand in a period, and the value zero when it is not. A variety of special events were modeled through dummy variables in the past. These included political instability and social conflict, terrorism, travel restrictions, foreign exchange restrictions, economic recessions, world fairs and sporting events, oil crises, and national celebrations (Crouch, 1994a; Di Matteo and Di Matteo, 1993; Rosensweig, 1986; Summary, 1987; Witt and Martin, 1987b). Dummy variables also were used to account for differences in the estimated demand coefficients and intercepts by countries of origin or destination in cross-sectional and panel studies (Tremblay, 1989). In time series studies which involved quarterly data, the effect of seasonality also was captured by incorporating the dummy variables (Chadee and Mieczkowski, 1987; Di Matteo and Di Matteo, 1993).

Witt and Martin (1987d) reviewed international tourism demand models that incorporated certain special events such as the world fairs, Olympic games, world expositions, and plays. They concluded that such events basically increase the inward flows of tourism to the country staging the event, while its impact on the demand for tourism to a country adjacent to the one staging the event can be either positive or negative. The magnitude of the effects varied considerably. Other researchers, on the other hand, found the dummy variables portraying the sporting events and political disturbances to have virtually no impact on the demand for international tourism (Crouch et al., 1992; Lee, 1996; Loeb, 1982).

Lag Effects

The effects of certain economic and non-economic variables upon international tourism demand may not be instantaneous. For instance, Crouch et al. (1992) found that the promotion conducted by the Australian Tourist Commission to have the greatest impact on its tourist flows during the current year or a one year later. Similarly, Anastasopoulos (1989) found that travelers' sensitivity towards changes in exchange rates was delayed to one to two years. Also, the main effect of price changes may be felt after a one year period because consumers are not well aware of destination prices and tend to plan their vacations with longer lead time (Crouch, 1994b). However, Stronge and Redman (1982) suggested that for annual data, the time unit is usually long enough for potential tourists to completely adjust to changes in income and prices, and hence, it is difficult for the effect of lags to be detected.

The approach used to model the dynamic effects in tourism demand functions was to lag the relevant explanatory variables by one or more time increments. In the past, a lagged dependent variable sometimes was included in the model to capture the effects of habit persistence and the rigidities of tourism supply in the destination country. The number of tourists who choose a vacation destination in a given year tends to depend on the numbers who chose it in previous years due to word-of-mouth recommendations and lower perceived risk associated with that particular destination. Also, the presence of a lagged dependent variable in a demand function can be a partial adjustment mechanism to accommodate supply constraints in the destination country (i.e., hotel accommodation, transportation capacity, and trained staff), which often cannot be increased rapidly (Witt and Witt, 1992).

In general, the habit persistence variable was not popular among previous researchers. Very few studies examined its impact on international tourism demand, and some ultimately removed the variable from the demand functions due to certain statistical problems such as serial correlation or multicollinearity. Hui and Yuen (1996) and Kliman (1981), however, managed to include the lagged dependent variable in their studies and found it to be significant in explaining foreign tourists' demand for Canada as a travel destination.

Population

The level of population in an origin country is expected to affect the total demand for the destination under consideration. As the higher the number of people resides in the tourist generating country, the number of foreign trips taken is expected to increase, holding other factors constant. In the past, however, population was seldom modeled as a separate explanatory variable in the demand studies mainly because of its high collinearity with income. Instead, the effect of population often was accommodated by modifying the dependent variable to become per capita form. As noted by Witt and Witt (1995, p.453), "although it is theoretically incorrect to exclude population, it is likely that population changes in tourist-generating countries will be small over the short-medium term, and hence the model will only be affected marginally."

## Dependent Variable

In the study of tourism, the quantity of tourism demanded was most frequently measured in terms of arrival or departure numbers as this was often the only type of

demand data available (Crouch, 1994a). A majority of the previous studies that focused on either total tourist trips or just vacation trips also regarded the determinants of demand for both as similar because of the difficulty in obtaining tourism data in disaggregate form (Witt and Witt, 1995). In cases where demand data in expenditures or receipts were available, they were used as a proxy measure for the quantity demanded. In general, tourism demand measured in terms of tourist numbers is less elastic than when it is measured in real money terms (Crouch, 1994a). The reason is that tourists can always adjust their length of stay and/or their daily expenditure in the destination country in response to changing circumstances. However, data on tourist numbers are generally more reliable in comparison to data on expenditures or receipts (Crouch, 1994a). In a few studies, tourist nights spent in the destination country and the average length of stay also were used to measure tourism demand (Crouch, 1994a; Witt and Witt, 1995).

## Regional Differences on Elasticities of Tourism Demand

From the review of previous studies, it seems apparent that the degree of tourists' responsiveness to tourism demand often varies from country to country. In a recent comprehensive review conducted by Crouch (1995), he integrated the empirical results of 80 previous tourism demand studies, and examined the responsiveness of tourists toward changes in income and prices as a function of their nationality.

From the origin country perspective, the author found that the average income elasticity of demand was the highest for tourists from the developed Asia, suggesting that tourists from this region were highly income sensitive. This finding was mainly related to Japan, which was the most frequently investigated origin country in the region in past

studies. Tourists from the Latin American countries, however, were found the least responsive to changes in income. In terms of destination prices, tourists from Latin America, Oceanic, and developed Asia were the most price sensitive whereas those from Northern Europe were the least price sensitive. However, tourists from developed Asia were the least exchange rate and travel cost sensitive among all the regions. Northern European tourists also appeared to be demand inelastic with respect to travel cost. On the other hand, North American and Oceanian tourists were the most sensitive towards travel cost changes.

From the destination country perspective, tourists to developing Asia appeared to be the most income sensitive, whereas tourists to developed Asia were found to be the least responsive to income changes, and the reason of which was not clear. International tourists also seemed to be most sensitive to price and travel cost changes in developed Asia, but were least sensitive to travel cost changes in developing Asia.

## Inbound Tourism Demand in East and Southeast Asia

To date, studies that modeled inbound tourism demand in East and Southeast Asia using an econometric approach remain relatively limited. Tables 8 and 9 give a summary of these models as well as the main empirical findings and conclusions of each study, respectively. This review consists of studies which used time series, cross-sectional, or panel data.

Table 8

Inbound Tourism Demand Models in East and Southeast Asia

| Author | Ref. date | Data period | Destination | Origin country | Dependent variable | Income | Population | Travel cost | Trend | Relative prices | Dummy | Ex. rate | Mktg. | Lagged Dependent | [a]Others |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cline | 1975 | 1960-1971 | [b]PATA Area | USA | Visits per capita | | X | | | | | | | | 1, 2 |
| | | | | Japan | Visits per capita | X | X | | X | | | | | | 3 |
| | | | | Australia | Visits | | X | | | | | | | | 4 |
| Lin & Sung | 1983 | 1962-1978 | HongKong | [c]World | Visits | X | X | | X | X | X | X | | | |
| | | | | | Expenditures | X | | | X | X | X | X | | | |
| | | 1974-1978 | | | Visits | X | X | X | | | | | | | 5 |
| | | 1973-1978 | | | Expenditures | X | | X | | | | | | | 5 |
| Gunadhi & Chow | 1986 | 1965-1981 | Singapore | [d]5 nations [d]World | Visits | X | | | | X | X | X | | | |
| Lee | 1996 | 1970-1989 | S. Korea | [e]7 nations | Expenditures per capita | X | | | | X | X | X | X | | |
| Vogt & Wittayakorn | 1998 | 1960-1993 | Thailand | [f]World | Expenditures | X | | | | X | | X | | X | 6, 7, 8 |

Note.

[a]other variables refer to 1 = total expenditure on recreation and travel; 2 = percent of GNP consumed; 3 = percent change in per capita GNP; 4 = per capita personal income lagged one year; 5 = total volume of merchandise trade; 6 = relative price lagged one year; 7 = exchange rate lagged one year; and 8 = income lagged one year.

[b]PATA stands for Pacific Asia Travel Association.

(table continues)

Table 8

Inbound Tourism Demand Models in East and Southeast Asia

[c] The following countries were used to represent the world:

Australia and New Zealand, Benelux, Canada, France, Siberia, India-Pakistan-Sri Lanka, Indonesia, Italy, Japan, Malaysia, Scandinavia, Singapore, S. Africa, Switzerland, Taiwan, Thailand, UK, USA, and W. Germany.

[d] The five nations included Australia, Indonesia, Japan, UK, and USA. The world was represented by the following countries:

Australia, Canada, France, India, Indonesia, Italy, Japan, Netherlands, New Zealand, Philippines, Sri Lanka, Thailand, UK, USA, and W. Germany.



[e] The 7 nations refer to Japan, USA, Taiwan, Hong Kong, UK, W. Germany, and Canada.

[f] The world was represented by the following countries:

Australia, France, Germany, India, Japan, Korea, Singapore, Taiwan, UK, and USA.

Table 9

Main Empirical Findings for Inbound Tourism Demand Models in East and Southeast Asia

| Study | $R^2$ | [a]DW | Destination | Origin | Dependent var. | Income | Population | Travel cost | [b]Relative Price | [c]Dummy | [d]Ex. rate | Mktg | Lagged dependent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [e]Cline | 0.99 | | PATA area | USA | Visits per capita | | 0.00013 | | | | | | |
| | 0.99 | | | Japan | Visits per capita | 0.00004 | | | | | | | |
| Lin & Sung 1983 (time series analysis) | 0.99 | 2.02 | Hong Kong | World | Visits | 3.89 | | | - 0.77 | 0.15 | | | |
| | 0.97 | 2.10 | | | Expenditures | 1.90 | | | -1.37 | -0.15 0.25 | -1.23 | | |
| Lin & Sung 1983 (cross section analysis) | 0.71-0.77 | | | | Visits | 0.21 to 0.32 | 0.21 to 0.28 | -0.83 to -0.93 | | | | | |
| | 0.68-0.79 | | | | Expenditures | 0.25 to 0.28 | | -0.84 to -0.96 | | | | | |
| Lin & Sung 1983 (Pooled analysis) | 0.75 | | | | Visits | 0.25 | 0.24 | -0.88 | | | | | |
| | | | | | Expenditures | 0.28 | | -0.89 | | | | | |
| Gunadhi & Chow 1986 | 0.99 | 1.88 | Singapore | Australia | Visits | 5.45 | | | -1.12 (SR) | -0.25 | -1.63 | | |
| | 0.99 | 1.77 | | Indonesia | | 0.82 | | | -1.13(HR) | -1.50 | | | |
| | 0.95 | 0.93 | | Japan | | 3.39 | | | -2.99 (SR) | -0.68 | | | |
| | 0.91 | 1.91 | | UK | | 7.30 | | | | | | | |
| | 0.91 | 1.31 | | USA | | 3.75 | | | | -0.66 | | | |
| | 0.98 | 1.35 | | World | | 4.69 | | | -.92 (HR) | -0.96 | | | |
| Lee 1996 | 0.92 | 1.65 | S Korea | Japan | Expenditures per capita | 11.66 | | | -4.50 | -0.79 | 0.12 | 0.07 | |
| | 0.91 | 1.33 | | USA | | 8.46 | | | -1.82 | | | 0.07 | |
| | 0.92 | 1.82 | | Taiwan | | 1.18 | | | | | | | |
| | 0.95 | 1.72 | | Hong Kong | | 3.28 | | | -1.36 | -0.60 | 1.92 | 0.05 | |
| | 0.90 | 1.71 | | W Germany | | 6.77 | | | -0.86 | -0.70 | | | |
| | 0.93 | 1.80 | | UK | | 6.59 | | | -2.45 | | | | |
| | 0.68 | 1.65 | | Canada | | 13.95 | | | | | 5.34 | | |
| [f]Vogt & Wittatakorn | 0.22 | | Thailand | Tbai's trade partners | Expenditures | | | | | | -1.20 | | -0.22 |

(table continues)

Table 9

Main Empirical Findings for Inbound Tourism Demand Models in East and Southeast Asia

Note.

All results were significant at the 90 percent confidence level.

[a]Refers to the Durbin Watson statistic.

[b]SR refers to relative price using the shopping index whereas HR refers to relative price using the hotel index.

[c]Dummy variables examined included political disturbances, oil crisis, exposition and Olympic games.



[d]Exchange rates with the negative coefficients were defined in origin country's currency relative to the destination's currency.

[e]The study was estimated in linear form.

[f]The dependent variable was examined in a first-difference. Exchange rate was defined in origin country's currency relative to destination's currency.

Demand Models

Table 8 indicated that four out of five studies examined the inbound tourism flows for a specific country in East and Southeast Asia, and three studies concentrated on the developed nations in the region (Hong Kong, Singapore, and South Korea). Two studies examined the inbound tourism flows from individual origin countries; two studies modeled aggregate travel from the world, and one employed both approaches.

The number of visits and the tourist expenditures, either in total or per capita amount, were the most common methods for measuring inbound tourism demand in East and Southeast Asia (four studies). However, Vogt and Wittayakorn (1998) formulated the travel demand model for Thailand in terms of first-differences (using variables as changes from one time period to another). Important explanatory variables of foreign tourism demand were income, population, travel cost, trend, relative prices, exchange rate, marketing, lagged independent and dependent variables, and dummy variables.

Income was entered into the models for all studies. GDP and GNP per capita were the most common measures used as a proxy for personal disposable income. However, Cline (1975) also used percent of GNP consumed and percent change in per capita GNP and personal disposable income as indicators for the income variable.

The next most frequently encountered explanatory variables were relative prices and exchange rates. The relative price variable in all studies was estimated by examining prices in the destination country relative to prices in the origin country. CPI was used as the proxy measure for prices in two studies (Lee, 1996; Vogt and Wittayakorn, 1998), others used tourist price index (Lin and Sung, 1983) as well as shopping and hotel price indices (Gunadhi and Chow, 1986).

Dummy variables were investigated in three studies, whereas population and trend were each examined in two studies. Dummy variables were entered into the models to represent political disturbances, foreign exchange restrictions, oil crisis, and certain special events either held by the investigated origin country or travel destination.

Because of the difficulty in obtaining the data, travel cost was examined in one study only. Lin and Sung (1983) used the economy class airfares of scheduled flight from Hong Kong to the capital of the origin countries as the indicator for the variable. Similarly, the marketing and lagged dependent variables, each appeared only in one study. Lagged independent variables also were found in one study, and these included the lagged income, relative price, and exchange rate variables.

Main Empirical Results and Conclusions Drawn

Table 9 summarizes the results concerning the East and Southeast Asian inbound tourism elasticity of demand. All results reported were statistically significant at least at the 90 percent confidence interval. All studies were examined using single equation estimation method (will be discussed in Chapter III). In Lin and Sung's (1983) study, cross-sectional analysis was conducted for different periods, and only the range of the elasticities of demand is presented in the table. Additionally, it is important to note that the results for Cline's (1975) and Vogt and Wittayakorn's (1998) models were not comparable to the rest because the former was estimated in a linear functional form, and the latter was investigated using variables in first differences.

Regardless of the form of the dependent measure and the type of data used, the income variable in all studies was found to be statistically significant. Almost all time-

series estimation of the income elasticities were greater than one, which suggested that tourists' behavior toward international tourism was generally highly income sensitive. Although it is well known for the cross-section estimates of demand elasticities to be greater than the estimates of time-series (Crouch, 1994a), the income elasticities estimated in Lin and Sung's (1983) study failed to support this contention.

In Lin and Sung's time-series model, the strong multicollinearity between the population and income variables ultimately forced the researchers to drop the former from the estimated equation. However, population was found to be statistically significant in their cross-sectional and panel studies, and Cline (1975) also found the variable significant for tourists from the USA.

With respect to travel cost, Lin and Sung (1983) found the variable to be significant for their cross-sectional and panel studies. However, regardless of the dependent measure used (number of visits or expenditures), the coefficients for the travel cost variable were inelastic.

The relative price variable was generally significant in all studies. Lin and Sung (1983) found that the dependent variable measured in the level of tourist expenditures was more sensitive to changes in relative prices than that measured in the number of visits. The variable also appeared to be an important determinant of international tourism demand for Korea (Lee, 1996); in most cases, the relative-price elasticities exceeded unity. On the other hand, Gunadhi and Chow (1986) found that tourists to Singapore responded differently to changes in relative shopping and hotel prices.

The estimated coefficients for the exchange rate variable were found to be statistically significant in four studies. Lee (1996) as well as Lin and Sung (1986)

concluded that tourism demand for Hong Kong and Korea was generally sensitive to exchange rate movements. Vogt and Wittayakorn (1998) also found exchange rates significant for tourism demand in Thailand. On the other hand, Gunadhi and Chow (1986) found that only the Australian tourists appeared to be highly sensitive toward exchange rate changes in Singapore.

Marketing, which was only included in one study, was found to be significant but inelastic in three of four models (Lee, 1996). The results led the author to suggest that promotional expenditures in Korea had low impact on its international tourist expenditures.

Finally, Vogt and Wittayakorn (1998) also found the lagged dependent variable to be significant in the inbound travel demand for Thailand, whereas the results for the dummy variables varied considerably in all studies, and hence, no general conclusions can be drawn.

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# CHAPTER III

# METHODOLOGY

## Model Specification

The major emphasis of this study was to assess the degree to which international tourist arrivals to the developing nations of Indonesia and Malaysia respond to changes in the primary economic determinants. Although a review of past literature reveals a wide array of factors affecting the inbound tourist flow pattern in a country, the theoretical framework for this type of studies rests heavily upon the principles of demand in economics. This classic demand theory suggests that demand is affected by changes in income, prices, and consumer preferences. Therefore, the major determinants of international tourism demand for Indonesia and Malaysia included measures of income, prices, and trend. Similar to previous studies that attempted to model tourism demand, the present study relied solely on the use of secondary data for its analysis. Hence, the availability of data from reliable sources was also an important concern in specifying the basic demand model.

### Research Objective One

As noted in Chapter I, the first research objective of this study was to estimate the inbound tourism demand models for Indonesia and Malaysia individually, from each of the six tourist-generating countries (Singapore, Japan, Australia, USA, UK, and Germany). Hence, annual time-series data covering the period 1980 to 1997 were used for estimating each pair of origin-destination countries in this study. Due to the complex nature of the price variable, two models, each employing different indicators for the

variable were used to accomplish this objective. The first model used exchange rate in addition to relative prices as two indicators for the price variable, whereas the second model examined the hybrid effect of these two indicators (method used to operationalize the variable will be discussed next). Therefore, the following models were estimated for each pair of the origin-destination countries:

$$\ln (TA_{ijt}/ P_{it}) = \beta_0 + \beta_1 \ln(Income_{it} / P_{it}) + \beta_2 \ln Rprice_{ijt} + \beta_3 \ln Ex_{ijt} + \beta_4 Trend_t + \beta_5 D_1 + \ldots + \beta_m D_n + \varepsilon \quad \text{(Model 1)}$$

$$\ln (TA_{ijt}/ P_{it}) = \lambda_0 + \lambda_1 \ln(Income_{it} / P_{it}) + \lambda_2 \ln Exrp_{ijt} + \lambda_3 Trend_t + \lambda_4 D_1 + \ldots + \lambda_m D_n + \varepsilon \quad \text{(Model 2)}$$

where

| | |
|---|---|
| $TA_{ijt}$ | Tourist arrivals from origin country i to destination country j in year t |
| $P_{it}$ | Origin country i population in year t |
| $Income_{it}$ | GDP in origin country i in year t |
| $Rprice_{ijt}$ | CPI in destination country j relative to CPI in origin country i in year t |
| $Ex_{ijt}$ | Currency of destination country j per unit of currency of origin country i in year t |
| $Trend_t$ | Time trend (defined as 1980=1, 1981=2 and so on) |
| $Exrp_{ijt}$ | CPI in destination country j relative to CPI in origin country i in year t (with an exchange rate adjustment) |
| $D_1 \ldots D_n$ | Dummy variables representing special events |
| $\varepsilon$ | Random error term |

$\beta, \lambda$ Coefficients to be estimated

An important consideration in constructing the tourism demand models for Indonesia and Malaysia was the operationalization of the independent variables and dependent measure. One major problem encountered in this study was that the secondary data obtained were sometimes not organized in the ways required for analysis. Hence, data transformation was needed to convert the raw data into the desired forms, and the following explains the methodology employed. The raw data and the final values which were used to estimate Model 1 and Model 2 are presented in Appendix A (Tables A-1 to A-6) and Appendix B (Tables B-1 to B-9), respectively.

The dependent variable in this study was measured as the per capita visits from the tourist generating country to Indonesia (Malaysia). The dependent measure was defined in per capita form in order to remove the effect of the increases in tourist arrivals due merely to population growth. The data for tourist arrivals to Indonesia from each of the six tourist-generating country were obtained from the following sources (See Table A-1): Statistical Information Services of Indonesia (Y. Supriatna, personal communication, January 30, 2000); United Nations Statistical Yearbook (1981-1985); and World Tourism Organization (1998). For Malaysia, the data for tourist arrivals from the six tourist-generating countries were obtained from the following sources (See Table A-2): Malaysian Tourism Promotion Board (N. A. Wahid, personal communication, February 21, 2000); United Nations Statistical Yearbook (1981-1985) (for Japan, Australia, USA, and UK only); and World Tourism Organization (1998). The data in Tables B-1 and B-2 were derived by dividing the number of tourist arrivals to Indonesia

(Malaysia) from each tourist-generating country by the population from that origin country. Table A-3 gives the population of each tourist-generating country in yearly estimates. The population data were obtained from the International Financial Statistics Yearbook (1998).

Income was entered into the demand models as the origin country's real per capita GDP. Although disposable income would be a more appropriate measure for vacation visits as it reflects how much people have spent after taxes, such form of data was not readily available for all countries examined in this study. Furthermore, the method of measurement for disposable income often varies across countries, and such differences might render the data unreliable. Data for the GDP were defined in real per capita form to account for the effects of population growth and inflation in each origin country. The GDP data defined at constant 1990 prices in national currency were obtained from International Financial Statistics Yearbook (1998) (See Table A-4). The data were then divided by the population to give the real per capita GDP (See Table B-3).

In comparison to the income variable, price is a much more complex construct. Although the inclusion of a specialized index designed to measure changes in the destination prices of goods and services purchased by tourists within Indonesia and Malaysia would be desirable, such forms of index exists neither for Indonesia nor Malaysia. Hence, the CPI was used instead as a proxy measure for the tourist cost variable in the study. Although it can be argued that the goods and services purchased by tourists are not similar to those included in the CPI, the counter argument can be made that consumer decisions are usually based on information contained in the latter index since they are the most familiar indicator to the average consumer. Specifically, the price

variable for both models was defined as a ratio of the CPI of the destination country to the CPI of the origin country in a given year (See Tables B-4 to B-7). The CPI data for the destination and tourist-generating countries were obtained solely from International Financial Statistics Yearbook (1998) (See Table A-5). The base year was 1990 (1990 =100) for the CPI of both destination and origin countries. However, the relative CPI for Model 2 was represented as the Indonesian (Malaysian) CPI multiplied by the exchange rate defined in the currency of the origin country per unit of currency of Indonesia (Malaysia) and divided by the CPI of the origin country (See Tables B-6 and B-7). Hence, the final form of the relative price variable for Model 2 consists of a combination of the effects of changes in CPI and exchange rates. Data for the average yearly exchange rates were obtained from International Financial Statistics Yearbook (1998) (more will be discussed in the next paragraph). The two approaches used to operationalize the relative price variable were similar to those found in previous studies (Crouch et al., 1992; Jud and Joseph, 1974; Kliman, 1981; Lee, 1996; Witt and Witt, 1992). In addition, the present measure of the relative price variable for both models only considered domestic tourism in the origin country and the trip to Indonesia (Malaysia) as the principal choices for the potential travelers. No attempt was made to model prices of alternative destinations, because the selection of the substitute destination(s) for Indonesia or Malaysia was (were) not readily apparent. Summary (1983) who modeled inbound tourism demand for Kenya also encountered the same problem. The author (Summary, 1983, p.92) noted, "The problem involves the selection of a substitute for Kenya's tourism services. Is travel to Tanzania an appropriate choice? Or is travel to South Africa a more suitable substitute? The choice depends upon the

individual traveler. Some might even consider a non-African country to be an appropriate substitute". Similar argument therefore can be applied to Indonesia and Malaysia.

The exchange rate variable used in Model 1 was defined in the destination country's real currency per unit of origin country's currency. Therefore, any significant changes upon the number of visits to Indonesia and Malaysia could not be attributed to the effect of inflation. Data for the nominal average yearly exchange rates defined in national currency against the US dollar were obtained from International Financial Statistics Yearbook (1998) (See Table A-6). The data then were converted to the currency of the destination country against the national currency, and divided by a ratio of the CPI in the destination country to the CPI in the origin country (See Tables B-8 and B-9).

A time trend variable was entered into the models to account for changes in the popularity of the destination country over time as a result of changing consumer tastes and preferences. The variable also is expected to capture the time effects of other excluded independent variables in the models.

Apart from the influences of income, price, and consumer preferences, demand for a vacation destination may be affected by other special events. Hence, dummy variables were included in both models to account for a number of special events in this study: $D_1$ for the Persian Gulf War in 1991; $D_2$ for the Visit ASEAN Year in 1992 (this variable was applicable to Japan, Singapore, Australia, and Germany only); $D_3$ for the environmental and the Asian currency crises in 1997; and $D_4$ for the Visit Malaysia Year

campaigns in 1990 and 1994. Only $D_1$ to $D_3$ were included in the models for Indonesia, while $D_1$ to $D_4$ were estimated in the models for Malaysia.

Given the models specified for international tourist flows to Indonesia and Malaysia, the following signs of the coefficients of elasticity should be expected:

1) The coefficient of the income variable is expected to be positive ($\beta_1 > 0$ for Model 1 and $\lambda_1 > 0$ for Model 2). That is, the higher the per capita income (GDP) of a tourist generating country, the more likely its people are to be able to afford the purchase of foreign travel.

2) The coefficient of the price elasticity should be negative for all tourist-generating countries ($\beta_2 < 0$ for Model 1 and $\lambda_2 < 0$ for Model 2). Thus, as relative prices decline, an increase in the number of tourists should be expected. Although Crouch (1992) noted that a positive price elasticity is sometimes possible if the destination prices remain constant while the origin prices vary, a close examination of the raw data for the CPI in this study revealed a moderate or tremendous variation in the CPI for both Indonesia and Malaysia.

3) The coefficient of elasticity of exchange rates between Indonesia (Malaysia) and a tourist generating country is expected to be positive ($\beta_3 > 0$ for Model 1). For example, if the Indonesian Rupiah (Malaysian Ringgit) devalues with respect to a tourist-generating country's currency unit, goods and services in Indonesia (Malaysia) will become less expensive for tourists from that country. Hence, an increase in the number of tourists from that origin country is anticipated.

4) The coefficient of the trend variable can be either positive or negative ($\beta_4 < 0$ or $\beta_4 > 0$ for Model 1 and $\lambda_3 < 0$ or $\lambda_3 > 0$ for Model 2). A positive coefficient is

expected if the destination becomes increasingly popular with a tourist generating country and vice versa.

5) The coefficient of the dummy variables can be either positive or negative, depending upon the characteristics of the events. In this study, the coefficient of the dummy variable representing i) the Persian Gulf War in 1991 is expected to be negative ($\beta_5 < 0$ for Model 1 and $\lambda_4 < 0$ for Model 2) ; ii) the Visit ASEAN Year campaign is expected to be positive ($\beta_6 > 0$ for Model 1 and $\lambda_5 > 0$ for Model 2); iii) the environmental and the Asian currency crises in 1997 is expected to be either positive or negative ($\beta_7 < 0$ or $\beta_7 > 0$ for Model 1 and $\lambda_6 < 0$ or $\lambda_6 > 0$ for Model 2), depending on whether the outbreaks of the forest fires had a more dominating and sustaining effect than the exchange rate benefit gained by the origin country as a result of the Asian currency crisis or vice versa; and iv) the Visit Malaysia Year campaigns in 1990 and 1994 is expected to be positive ($\beta_8 > 0$ for Model 1 and $\lambda_7 > 0$ for Model 2).

Due to the limited data available in Indonesia and Malaysia, the travel cost variable was not included in the demand models. Many researchers in the past also either failed to include travel cost in the demand functions or were forced to drop the variable as a result of the following reasons: 1) inconsistency and lack of data; 2) the complexity of the transportation cost structure; and 3) the problem of multicollinearity between travel cost and income in the demand models (Jud, 1971; Kwack, 1972; Lee, 1996; Loeb, 1982; O'Hagan and Harrison, 1984; Uysal and Crompton, 1984). The exact consequences of omitting travel cost in a demand model remain inconclusive. Jud (1971) noted that the failure to explicitly consider the effect of this variable will cause a downward shift in the estimates of the income elasticity if the level of the international airfares shows a strong

negative correlation with the level of income. However, Crouch (1996) who integrated a large number of tourism demand studies through the application of meta-analysis concluded that the omission of the travel cost variable generally did not seem to significantly influence the estimated income and price elasticities of demand.

The difficulty in obtaining the data for total marketing expenditures spent by the Indonesian and Malaysian governments in the origin countries also prevented the marketing variable in quantitative form from entering into the demand models. However, the impacts of some of these important promotional efforts were accounted for by the incorporation of the dummy variables mentioned above (i.e., the Visit ASEAN Year and Visit Malaysia Year campaigns).

Given the restricted number of degree of freedom and the lack of popularity of the lagged dependent variable among previous researchers (Witt and Witt, 1992), no attempt was made to examine this variable. Besides, the presence of lags of the dependent variable coupling with the use of the ordinary least square (OLS) estimation procedure (will be discussed in the following section) would render the estimates of the parameters biased and the tests of hypotheses invalid in small samples such as the one in this study (Ramanathan, 1998).

There certainly were other factors which might influence the demand for international tourism in Indonesia and Malaysia. However, it would be impossible to include all possible independent variables in the proposed models owing to certain statistical problems. A parsimonious specification (one with fewer parameters) is often preferred in econometric modeling because it has the following advantages :1) increased precision of estimates because of reduced multicollinearity; 2) more degrees of freedom

(increases the power of tests) and hence more reliable estimates; and 3) a simpler model, which is easier to comprehend than a complex one (Ramanathan, 1998). Other excluded explanatory variables that might explain variations in the demand for tourism in Indonesia and Malaysia were expected to be captured by the error term.

The double-log functional form of the demand equation was chosen to test the data in this study. In general, this model is very popular for estimating demand functions in economics (Ramanathan, 1998). It also has an added advantage that the resulting estimated regression coefficients in this functional form can be interpreted directly as the demand elasticities. Most importantly, previous researchers who have tested the suitability of different functional forms in the context of international travel demand seem to agree that the double-log form tends to provide a better fit to the data (Crouch, 1994; Jud, 1971; Lee, 1996; Witt and Witt, 1995).

Research Objective Two

The second research objective of this study was to examine the stability of inbound tourism demand models for Indonesia and Malaysia. Specifically, the study aimed to examine the possibility of a structural shift in the demand models as a result of the formation of an important tourism development organization in each destination country. A structural shift was hypothesized between 1980 to 1988 (Period 1) and 1989 to 1997 (Period 2) for Indonesia and 1980 to 1986 (Period 1) and 1987 to 1997 (Period 2) for Malaysia. Period 1 was before formation of the ITPB and MOCAT, and Period 2 was after their formation. To test if the structures for the two periods were different for Indonesia or Malaysia, the following models were estimated:

$$\ln (TA_{ijt}/ P_{it}) = \beta_0 + \beta_1 \ln(Income_{it} / P_{it}) + \beta_2 \ln Exrp_{ijt} + \beta_3 Trend_t + \lambda_1 D_1 + \ldots + \lambda_5 D_5 + \varepsilon \quad \text{(restricted model)}$$

$$\ln (TA_{ijt}/ P_{it}) = \beta_0 + \beta_1 \ln(Income_{it} / P_{it}) + \beta_2 \ln Exrp_{ijt} + \beta_3 Trend_t + \lambda_1 D_1 + \ldots + \lambda_5 D_5 + D_s[\alpha_0 + \alpha_1 \ln(Income_{it} / P_{it}) + \alpha_2 \ln Exrp_{ijt} + \alpha_3 Trend_t + \gamma_1 D_1 + \ldots + \gamma_5 D_5] + \varepsilon \quad \text{(unrestricted model)}$$

where

| | |
|---|---|
| $TA_{ijt}$ | Tourist arrivals from origin country i to destination country j in year t |
| $P_{it}$ | Origin country i population in year t |
| $Income_{it}$ | GDP in origin country i in year t (in 1990 US dollars) |
| $Exrp_{ijt}$ | CPI in destination country j relative to CPI in origin country i in year t (with exchange rate adjustment and in 1990 US dollars) |
| $Trend_t$ | Time trend (defined as 1980=1; 1981=2 and so on) |
| $D_1 \ldots D_5$ | Country dummy variables (defined as Singapore=1; Japan=2; Australia=3; USA=4; UK=5) |
| $D_s$ | Dummy variable representing the presence of the ITPB or MOCAT (defined as D89 for Indonesia. D89=1 for 1989 to 1997; others=0) (defined as D87 for Malaysia. D87=1 for 1987 to 1997; others=0) |
| $\varepsilon$ | Random error term |
| $\beta, \lambda, \alpha, \gamma$ | Coefficients to be estimated |

Pooled time-series and cross-sectional (or panel) data covering 1980 to 1997 and the six important tourist-generating countries (Singapore, Japan, Australia, USA, UK,

and Germany) were used to estimate the possibility of a structural shift for each of the two destination countries in this study. Under the null hypothesis, the nine interaction variables in the unrestricted model would be restricted to zero ($\alpha_0 = \alpha_1 = \alpha_2 = \alpha_3 = \gamma_1 = \ldots = \gamma_5 = 0$). That is, their joint effect on the tourist flows to Indonesia or Malaysia would not be significant.

Similar to the basic demand model specified for objective one, the restricted model employed is based on the classic demand theory of economics, which suggests that demand is affected by changes in consumers' income, prices of goods and services, and consumer tastes and preferences. Country dummy variables also were included in the model to allow the regression intercepts to vary. Pooled regressions with the country dummy variables are expected to provide more reliable results than those generated from pooling without allowing for intercept differences (Tremblay, 1989). Germany was used as the base country in which the sign of each country dummy variable would indicate the difference in tourism demand relative to the Germany.

The unrestricted model formulated was an extension of the restricted form. A dummy variable ($D_s$) representing the presence of the ITPB or MOCAT was added into the unrestricted equation. Since the entire demand relation might have shifted between Period 1 and Period 2, it was necessary to generate all the interaction terms by multiplying $D_s$ with each of the independent variables specified in the restricted model. Dummy variables representing the special events were not considered in the models to avoid the proliferation of the independent variables that would result in the loss of degrees of freedom and a reduction in the power of tests.

Tables B-10 to B-12 in Appendix B present additional information for the data used for estimating the models for research objective two. The dependent measure and the trend variable for the restricted and unrestricted models were defined the same ways as in Models 1 and 2 for research objective one. Nevertheless, the income variable was entered into the models as the origin country's real per capita GDP in US dollar for the purpose of standardization (See Table B-10). This was achieved by dividing the per capita GDP in constant 1990 national currency by the exchange rate. The relative price variable was measured as the CPI of the destination country relative to the CPI of the origin country, with an exchange rate adjustment applied to this general definition (the steps taken to transform the data were the same as described for the relative price variable in Model 2 for research objective one). The final form of the relative price variable also was converted to US dollar for the purpose of standardization (See Tables B-11 and B-12). No attempt was made to include exchange rates as an independent variable in this part of the study. This is because the results concerning the tourist flow patterns to Indonesia and Malaysia from the six tourist-generating countries using the time-series data (research objective one) indicated that the exchange rate adjusted-relative price was a better indicator for the price variable for both destination countries. Similar to Models 1 and 2, double-log functional form of the demand equation was chosen to test the data in this part of the study.

## Data Analysis

Intercooled Stata version 5.0 was used to analyze the models in the present study. OLS multiple regression technique, which has dominated the estimation procedure in past

tourism demand equations (Crouch, 1994), was utilized to estimate the demand for Indonesia and Malaysia as travel destinations. A multiple regression model allows the researcher to explain the phenomenon of interest (dependent variable) by expressing it as a linear function of more than one quantitative and/or qualitative variables. The OLS procedure involves the use of calculus to derive the parameter estimates in a multiple regression model with relative precision. The optimality criterion used by the OLS procedure is to select those least square estimates for which the error sum of squares (ESS) is a minimum (Ramanathan, 1998). In other words, this estimation procedure allows the researcher to find the prediction line which is the "best fit" for the data.

A review of previous empirical studies that have attempted to estimate the relationship between the demand for international tourism and its determinants demonstrated the dominance of the OLS procedure in single-equation models (Crouch, 1994; Jud, 1971; Kanellakis, 1975; Lee, 1996; Summary, 1983; Uysal and Crompton, 1984; Witt and Witt, 1992; Witt and Witt, 1995). A single-equation model refers to a demand model that contains only one genuinely endogenous or dependent variable. Previous studies using single-equation models generally justified their decision on the basis that, with regard to the modeling of international tourism demand, the independent variables can be assumed to be predetermined (Crouch, 1994; Jud, 1971; Kenellakis, 1975; Uysal and Crompton, 1984, Witt and Witt, 1992). In other words, the researchers can ignore the problem of simultaneity of supply and demand because supply is largely perfectly elastic since the demand by foreign travelers for tourism services is usually small as compared to the demand by domestic travelers (Crouch, 1994). Furthermore, the supply of tourism facilities in a destination may reasonably be assumed to be perfectly

elastic when the period of consideration is only short-term (i.e. yearly) (Jud, 1971). A small number of researchers also have advocated the use of simultaneous equation approaches (or a system approach) such as two-stage least squares regression, Almost Ideal Demand System (AIDS) and Linear Expenditure System (LES) (Crouch, 1994). However, Jud (1971, p.69) noted, "simultaneous equation techniques have so far rarely led to convincing results in demand analysis. This appears due in large part to the failure of economic theory to formulate an adequate supply equation and to the sensitivity of simultaneous equation methods to errors in specification". Furthermore, a relatively large sample size is required for the application of the system approaches to be "asymptotically consistent" (Jud, 1971). Morley (1997) compared the use of OLS and seemingly unrelated regressions estimation (SURE) (a procedure applicable to a system of equations) on tourism demand models, and little difference was found between the two methods. The results of the study generally led the author to conclude that the OLS technique performs well with regards to estimating tourism demand models, and the use of more complex estimation techniques is unwarranted. The author further concluded that OLS is reasonably robust to tourism data peculiarities of correlation across equations, heteroscedasticity, and autocorrelation and can be used with confidence. Given that the international tourism receipts only accounted for 0.4 to 3.6 percent of the GDP in Indonesia and 1.5 to six percent in Malaysia between 1981 to 1997, the levels of foreign tourism in both destinations could be considered small as relative to their total demand. Hence, the present study used the traditional single equation method (OLS) to estimate inbound tourism demand for Indonesia and Malaysia.

The estimation procedure began with the general full models specified above and then reduced them by eliminating one at a time the variable with the least significant coefficient. Specifically, the t-test procedure was conducted to test the statistical significance of each regression coefficient. This approach, referred as the "general to simple" or the Hendry/LSE approach, is strongly advocated by many econometricians at the London School of Economics as it results in a parsimonious specification (Ramanathan, 1998).

The Wald test (also called the joint F-test) was applied to examine the possibility of a structural change in the tourism demand models for Indonesia and Malaysia. The procedure allows all the coefficients for the interaction terms in the unrestricted model (nine parameters) to be tested for their joint effect on tourism demand. From the models specified, it should be noted that the restricted model could be obtained by omitting all the interaction terms from the unrestricted form (nine fewer parameters). Hence, under the null hypothesis ($\alpha_0 = \alpha_1 = \alpha_2 = \alpha_3 = \gamma_1 = \ldots = \gamma_5 = 0$), the difference between the error sum of squares of the restricted model ($ESS_R$) and the unrestricted model ($ESS_U$) is likely to be small (Ramanathan, 1998). "Small" or "large" is determined by comparing the above difference to the $ESS_U$. If the difference ($ESS_R$ - $ESS_U$) is "small" relative to the $ESS_U$, it can be concluded that omitting the nine interaction variables has not changed the ESS sufficiently to believe that their coefficients are significant. Because the null hypothesis was rejected in this study, the final estimated models associated with Period 1 and Period 2 were obtained. The estimated coefficients for Period 1 were determined by setting the independent variable D89 (for Indonesia) or D87 (for Malaysia) in the

unrestricted model to zero. On the other hand, the relation for Period 2 was obtained by setting D89 or D87 to one and combining terms for the same variables.

As the empirical investigation progressed, there was an increasing awareness of the existence of some of the major estimation problems, particularly those of multicollinearity and serial correlation which could affect the precision of the parameter estimates generated by the OLS procedure.

Multicollinearity arises when some of the independent variables in the models have approximate linear relationships. The existence of multicollinearity will lead to increases in the standard errors of the regression coefficients and reduces the t-statistics. This, in turn, will cause the coefficients to be less significant (although the tests of hypotheses will remain as valid). One indication of the possible existence of multicollinearity is the associated high R squared value but low t-statistics. In this study, a pair-wise product moment correlation matrix and the value of the tolerance for each estimated regression coefficient were used to identify the problem. A general rule of thumb is that if the absolute value for the coefficient of correlation is above 0.70 (Davis, 1971), or the simple squared coefficient of correlation ( $r^2$) is greater than the indicator for the goodness of fit for the entire equation ($R^2$) (Cassidy, 1981), multicollinearity is considered serious. Similarly, a tolerance of 0.05 or less may be worthy of further investigation ("Stata learning", 1999). When multicollinearity was present, the problem was overcome partially by eliminating insignificant coefficients from the equation one at a time, and a number of regression runs that involved different combinations of the independent variables (those that were not strongly correlated) were undertaken.

The presence of first-order serial correlation was another major concern in this study. The problem arises when the error term of a regression model for a specific period is correlated with the error term in previous period. If the existence of this problem is ignored, the OLS estimates will be inefficient and the tests of hypotheses will be invalid. The main diagnostic tests used to detect the problem in this study included the Durbin-Watson (DW) test for the time-series data, and the Breusch-Godfrey Lagrange Multiplier (LM) test for the panel data (Ramanathan, 1998).

The DW test provides both the upper and lower limits of the DW statistics (d) for various sample sizes and numbers of independent variables. For a one-tailed test for positive serial correlation, a calculated d statistic that lies above the tabulated upper limit will render the researcher to conclude that the error terms are serially independent. Otherwise, the error terms will be considered as correlated if the calculated d is less than the tabulated lower limit. If, however, the value of d lies between the upper and the lower limits, the test will be considered as inconclusive. When the DW test give inconclusive results, the rule of approximation is to assume independent errors for models with d statistics within the range of 1.5 to 2.5 (Witt and Witt, 1992). For negative serial correlation, 4 – d is compared with the upper and lower limits of the d statistics.

The Breusch-Godfrey LM test is an alternative serial correlation test that is conclusive in all cases and is applicable to large samples only (requires at least 30 degrees of freedom). It consists of running an auxiliary regression of the estimated residual for period t against the residual for previous period and all the independent variables in the model. Under the null hypothesis of zero autocorrelation, the LM statistic [$LM = (n-1)R^2$] is distributed chi-square with one degree of freedom. If the test

statistic exceeds the critical value, the conclusion is that there is significant first-order serial correlation.

In this study, the Cochrane-Orcutt (CORC) iterative procedure (Ramanathan, 1998) was used as the alternative estimating method when the error terms were found to be serially dependent in the time-series data. The CORC procedure transforms the original regression model to a form in which the OLS procedure is applicable through a number of iterations (generally no more than three to six iterations). STATA version 5.0 was used in this study to carry out all the steps required of the iterative procedure with a simple command.

Apart from the problems of multicollinearity and first-order serial correlation, heteroscedasticity also was found to be prevalent for the panel data. Heteroscedasticity concerns the unequal distribution of the error variances across all observations. Similar to the problem of serial correlation, the existence of heteroscedasticity will invalidate the tests of hypotheses and the OLS estimators will be inefficient if this problem is ignored. In this study, the Breusch-Pagan Lagrange Multiplier (LM) test (Ramanathan, 1998) was used to detect for heteroscedasticity. The Breusch-Pagan LM test is also a large sample test that assumes the variance to depend on a number of variables (denoted as Zs and all of the Zs were the independent variables in the model in the present study). The procedure consists of running an auxiliary regression of the estimated residual squared against the Zs, including the constant term (the total number of the variables is denoted as p). Under the null hypothesis of homoscedasticity (equal scatter of error variances), the LM statistic is distributed chi-square with p - 1 degrees of freedom. If the test statistic ($LM = nR^2$) exceeds the critical value, the conclusion is that there is heteroscedasticity.

Feasible Generalized Least Squares (FGLS) procedure (Ramanathan, 1998) was used as the alternative estimating method when heteroscedasticity and/or first-order serial correlation was detected for the panel data. FGLS is generally used to obtain consistent and asymptotically more efficient estimates of the parameters if heteroscedasticity is found. The procedure involves estimating the structure of the heteroscedasticity, then dividing each variable (including the constant term) by the standard deviation of the error term and applying OLS to the resulting transformed model. The FGLS procedure from STATA version 5.0 also can be performed to correct for first-order serial correlation in the panel data.

In view of these, the judgement of the acceptability of an econometric model is indeed a complicated procedure. Ramanathan (1998) noted that indiscriminate use of a specific mechanical criterion should be avoided. Hence, the final models in this study using both the time-series and panel data were chosen based upon a number of criteria: the overall goodness of fit, the expected sign for each independent variable, and the extent to which the model suffered from such estimation problems as multicollinearity, first-order serial correlation, and heteroscedasticity.

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# CHAPTER IV

# MODELING TOURIST FLOWS TO INDONESIA AND MALAYSIA


## Abstract

The purpose of this study was to examine the major factors that influence the flow patterns of tourists from six important tourist-generating countries to Indonesia and Malaysia. The primary determinants included in the demand models were income, prices, and time trend. Two models that employed different indicators for the price variable were estimated; one with exchange rates in addition to relative prices, whereas the other included only an exchange rate adjusted-relative price variable. Annual time-series data covering the period 1980 to 1997 were used for estimation. The results generally indicated that the factors provide reasonably good explanations for the demand for Indonesian and Malaysian tourism. The measure of the joint effect of the changes in exchange rates and relative prices also seems to be a better indicator for the price variable for both destination countries. The study has important marketing implications for the tourism industries in Indonesia and Malaysia.

The rapid growth of international tourism over the past three decades has attracted considerable attention in many developing nations, including Indonesia and Malaysia. The growing importance of tourism in these countries is indicated by their tourism revenues for the past 17 years. They rose from an estimated $246 million in 1980 to $6.6 billion in 1997, an approximate 26-fold increase, for Indonesia, and increased 11-fold, from $317 million in 1980 to $3.9 billion in 1997, for Malaysia (United Nations Statistical Yearbook 1985; World Tourism Organization 1998). Because of these increases, the tourism industry has since been included as an integral part in the economic planning of Indonesia and Malaysia.

However, emphasis on the tourism sector by the governments of both countries began only in the early 1980s (Liden and Tyler 1992; Schwarz 1988). Being late comers into the tourism industry, Indonesia and Malaysia face a great deal of competition, particularly with the two neighboring countries, Singapore and Thailand, to obtain a share of this market. In view of the fierce competition and the many opportunities presented by the tourism industry, factors that affect international tourists' demand for Indonesia and Malaysia deserve immediate attention. Also, identification of the underlying causes for tourist flow patterns is important for efficient planning and management of inbound tourism in the countries.

The econometric approach has been one of the most popular techniques for studying the determinants of international tourism demand. This is because the theoretical framework for this type of study rests heavily upon the principles of demand in economics. However, previous studies using econometric modeling of tourist demand have focused mainly on the developed nations and have not considered this aspect of

tourism in Indonesia and Malaysia. Hence, the purpose of this study was to examine the major economic factors that influence the flow patterns of tourists to Indonesia and Malaysia using the econometric approach.

## Inbound Tourism in Indonesia and Malaysia

Over the last two decades, the tourism industries in Indonesia and Malaysia tourism have expanded tremendously. Table 10 gives the total tourist arrivals and the annual growth rates for both nations from 1980 to 1997. The number of tourist arrivals in Indonesia grew approximately eightfold, from 600 million in 1981 to about 5 billion in 1997, at an average annual rate of 14.8 percent. Tourist arrivals to Malaysia, on the other hand, increased from 1.6 billion to 6.2 billion from 1981 to 1997, at an average annual rate of 9.5 percent.

Insert Table 10

Several important events in the 17 years have been noted for their influences on tourist flow patterns in Indonesia and Malaysia. The huge surges of tourists in Malaysia in 1990 and 1994 were attributed to its "Visit Malaysia Year" campaigns (Anonymous 1993b; Anonymous 1997b; King 1994). The substantial effort of the "Visit ASEAN (Association of Southeast Asian Nations) Year 1992" campaign, which was directed at the ASEAN nations themselves (Brunei Darusallam, Indonesia, Malaysia, Philippines, Singapore, and Thailand) as well as the Australian, German, and Japanese markets, was credited for the increases in tourist arrivals to Indonesia and Malaysia in 1992 (Anonymous 1993a; Schansman 1991). On the other hand, the negative impact of the Gulf War has been cited often as the main reason for the slow growth and drastic drop in

the number of visits for both countries in 1991 (Mcbeth 1994; Schansman 1991; Selwitz 1991; Soledad 1996). In 1997, the tourist industry in Indonesia experienced its first stagnant period in the decade, whereas that in Malaysia experienced a negative growth. This bad performance was attributed to the Asian currency crisis and the outbreaks of forest fires in Indonesia (Leiper and Hing 1998).

The biggest tourist supplier for Indonesia and Malaysia is the Asian Pacific region. Between 1985 to 1997, this region alone contributed an average of 71 percent and 87 percent of tourist arrivals to Indonesia and Malaysia, respectively (World Tourism Organization 1998). Among all countries in Asia, Singapore and Japan have emerged as two of the most important suppliers of tourists to both countries. Together with the United Kingdom (UK), Germany, Australia, and the United States of America (USA), they contributed over 50 percent of Indonesia's and Malaysia's tourists between 1985 to 1997 (World Tourism Organization 1998). With the recent decline in regional international travel as a result of the Asian economic downturn, long-haul markets such as the USA, UK, and Germany have grown to become more important for both destinations. These tourist-generating countries are more likely to be the primary sources of supply of "hard" currencies for reforming the Indonesian and Malaysian economies in the near future.

## Determinants of International Tourism Demand

A review of past literature revealed a wide array of factors that affect international vacation demand. However, income always has been cited as the most important variable that provided the greatest explanatory power (Anastasopoulos 1989; Covington,

Thunberg, and Jauregui 1994; Crouch, Schultz, and Valerio 1992; Hui and Yuen 1996; Jud and Joseph 1974; Kwack 1972; Lee 1996; Loeb 1982; Uysal and Crompton 1984). Following the basic principle of demand in economics, the demand for a travel destination country is expected to surge with an increase in the tourist-generating country's income, holding all other factors constant. Private consumption or personal disposable income has been suggested as the best measure for vacation visits, but gross national product (GNP) and gross domestic product (GDP) also were used frequently in vacation demand functions (Di Matteo and Di Matteo 1993; Hui and Yuen 1996; Jud and Joseph 1974; Lee 1996; Uysal and Crompton 1984). Empirical results of past tourism demand models often have been viewed in terms of elasticity of demand. The estimated income elasticities commonly were found to be positive and above unity (greater than 1), albeit a negative income elasticity, which denoted inferior tourism destinations, was observed occasionally (Chadee and Mieczkowski 1987).

Price is another important factor that has appeared frequently in the travel demand functions as: 1) the prices of tourist goods and services in the destination country; 2) the effect of exchange rate changes on purchasing power; and 3) the transportation costs between countries (Crouch 1994b; O'Hagan and Harrison 1984; Witt and Witt 1992).

Basic economic demand theory implies that the higher the prices of tourist goods and services at a destination, the lower the tourism demand, other things remaining constant. However, tourists' demand for a particular travel destination also may be a response to changes in the prices of other alternative destinations or domestic tourism in the origin country. Hence, the destination price variable in typical travel demand models

frequently has been specified in relative form to account for the cross-price effect. In the past, use of a tourist price index or other similar indices defined over all goods purchased by tourists, has been suggested as the best form of measurement. However, such data often are not available for most countries. The consumer price index (CPI) has been used instead as a proxy measure in most studies (Crouch, Schultz, and Valerio 1992; Lee 1996; Rosensweig 1986; Stronge and Redman 1982; Uysal and Crompton 1984). The findings for the effect of destination prices upon foreign travel demand have varied widely. The variable was significant in many cases, but several studies found an unexpected positive sign and statistically insignificant values (Crouch 1994b; Jud and Joseph 1974; Kwack 1972; Little 1980; Loeb 1982; Martin and Witt 1988; Uysal and Crompton 1984).

The relationship between changes in a country's price levels and the changes in its currency values remains a complicated and unresolved issue for modeling tourism demand functions (Gray 1966). In the past, the effect of exchange rate changes often was accounted for indirectly by converting the destination price variable (either a tourist price index or an equivalent measure such as the CPI) into the currency of the tourist-generating country (Jud and Joseph 1974; Kliman 1981). However, the recent practice has been to model exchange rate as a separate explanatory variable in addition to the destination price variable. It is believed that the rapid changes in exchange rates are perceived more readily by potential foreign travelers than changes in the country's price levels (Gray 1966; O'Hagan and Harrison 1984; Witt and Witt 1992). When the exchange rate is included as a separate independent variable in a travel demand function, the depreciation of a destination's currency relative to an origin country's currency is

expected to lead to an increase in international tourism demand for the destination. This hypothesis has been supported by certain studies (Gerakis 1965; Hui and Yuen 1996; Lin and Sung 1983; Rosensweig 1986) but not by others (Chadee and Mieczkowski 1987; Gray 1966; Loeb, 1982; Summary 1987).

An increase in travel costs is expected to result in a decline in international travel, holding other factors constant. Previous studies that attempted to examine travel cost as a determinant for tourism flows were concerned mainly about the costs of travel by air between origin and destination major cities. Results regarding the impact of travel cost upon tourism demand are very uncertain. The variable was found to be significant in some studies (Covington, Thunberg, and Jauregui 1994; Jud and Joseph 1974; Kliman 1981) and insignificant in others (Gray 1966; Little 1980).

The demand for vacation destinations also may be subject to changes in the popularity of the destination over time as a result of changing consumer preferences. Hence, some of the past studies have attempted to account for this factor by incorporating a time-trend in the demand function. In addition to capturing the effect of changing consumer tastes for a specific travel destination, the time-trend factor also accounts for all time effects of other explanatory variables not explicitly included in the demand function (Witt and Witt 1992). Demand theory implies that the estimated coefficient of the trend term can be either positive or negative, depending on the degree of the popularity of the destination over time. However, the effect of the trend factor in previous tourism demand studies has not been consistent. For instance, Crouch, Schultz, and Valerio (1992) found the variable to have little measurable effect on international travel demand

for Australia, while other conclusions varied from weak to moderately strong (Crouch 1994b).

Demand for a vacation destination also may be affected by special events. A variety of these, such as political instability, social conflict, terrorism, economic recessions, world fairs, and sports, have been modeled through dummy variables (Crouch 1994a; Di Matteo and Di Matteo 1993; Rosensweig 1986; Summary 1987; Witt and Martin 1987). However, results for each specific event or situation varied considerably from study to study and country to country.

## Methodology

### Model specification

Econometric models were estimated to explain tourist flows from each of the six tourist generating-countries (Singapore, Japan, Australia, USA, UK, and Germany) to each of the two destinations (Indonesia and Malaysia). The basic demand model employed is based on the classic demand theory of economics, which suggests that demand is affected by changes in income of consumers, prices of goods and services, and preferences of consumers. A review of related literature and the availability of data were also primary sources of concern in formulating the models for this study. The major determinants of international tourism demand for Indonesia and Malaysia therefore included measures of income, relative prices, exchange rates, trend term, and special events.

Because of the complex nature of the price variable, two models that employed different indicators were used to analyze the tourist flow patterns to Indonesia and

Malaysia. The first model used exchange rates in addition to the relative price variable as indicators for prices. The second model examined the hybrid effect of these variables by including merely the exchange rate-adjusted relative prices. The following models were estimated for each pair of origin-destination countries:

$$\ln (TA_{ijt}/ P_{it}) = \beta_0 + \beta_1 \ln(Income_{it} / P_{it}) + \beta_2 \ln Rprice_{ijt} + \beta_3 \ln Ex_{ijt} + \beta_4 Trend_t + \beta_5 D_1 + \ldots + \beta_m D_n + \varepsilon \quad \text{(Model 1)}$$

$$\ln (TA_{ijt}/ P_{it}) = \lambda_0 + \lambda_1 \ln(Income_{it} / P_{it}) + \lambda_2 \ln Exrp_{ijt} + \lambda_3 Trend_t + \lambda_4 D_1 + \ldots + \lambda_m D_n + \varepsilon \quad \text{(Model 2)}$$

where

| | |
|---|---|
| $TA_{ijt}$ | Tourist arrivals from origin country i to destination country j in year t |
| $P_{it}$ | Origin country i population in year t |
| $Income_{it}$ | GDP in origin country i in year t |
| $Rprice_{ijt}$ | CPI in destination country j relative to CPI in origin country i in year t |
| $Ex_{ijt}$ | Currency of destination country j per unit of currency of origin country i in year t |
| $Trend_t$ | Time trend (defined as 1980=1, 1981=2 and so on) |
| $Exrp_{ijt}$ | CPI in destination country j relative to CPI in origin country i in year t (with an exchange rate adjustment) |
| $D_1 \ldots D_n$ | Dummy variables representing special events |
| $\varepsilon$ | Random error term |
| $\beta, \lambda$ | Coefficients to be estimated |

The dependent variable in this study was measured as the per capita visits from the tourist generating-country to Indonesia (Malaysia). This was done to remove the effect of increases in tourist arrivals due merely to population growth.

The GDP in the origin country's currency was used to represent the income variable. Data for the GDP were defined in real per capita form to account for the effects of population growth and inflation in each origin country.

The relative price variable was measured as the CPI of the destination country relative to the CPI of the origin country in a given year. For Model 2, however, the relative CPI was converted to the origin country's currency. Hence, the final form of the relative price variable for Model 2 consists of a combination of the effects of changes in prices and exchange rates. The two approaches used to operationalize the relative price variable were similar to those found in previous studies (Crouch, Schultz, and Valerio 1992; Jud and Joseph 1974; Kliman 1981; Lee 1996; Witt and Witt 1992). The measure of relative prices for both models considered only domestic tourism in the origin country and the trip to Indonesia (Malaysia) as the principal choices for potential travelers. Substitute destination(s) for Indonesia and Malaysia were not readily apparent.

The exchange rate variable used in Model 1 was defined in the destination country's real currency per unit of origin country's currency. Therefore, any significant changes in the number of visits to Indonesia and Malaysia could not be attributed to the effect of inflation.

Dummy variables also were included in the models to account for a number of special events: $D_1$ for the Persian Gulf War in 1991; $D_2$ for the Visit ASEAN Year in 1992 (applicable to Japan, Singapore, Australia, and Germany only); $D_3$ for the

environmental and the Asia currency crises in 1997; and $D_4$ for the Visit Malaysia Year campaigns in 1990 and 1994. Only $D_1$ to $D_3$ were included in the models for Indonesia, whereas $D_1$ to $D_4$ were estimated in the models for Malaysia. The sign of the coefficient for $D_3$ could be either positive or negative, depending on whether the outbreaks of forest fires had a more dominant and sustaining effect than the exchange rate benefit gained by the origin country as a result of the Asian currency crisis or vice versa.

Models 1 and 2 thus postulate that tourist arrival per capita from each of the tourist-generating countries is a function of per capita real income, relative prices, real exchange rate, trend, and special events. It is hypothesized that:

$\beta_1 > 0; \beta_2 < 0; \beta_3 > 0; \beta_4 < 0$ or $\beta_4 > 0; \beta_5 < 0; \beta_6 > 0; \beta_7 < 0$ or $\beta_7 > 0; \beta_8 > 0$ (Model 1)

$\lambda_1 > 0; \lambda_2 < 0; \lambda_3 < 0$ or $\lambda_3 > 0; \lambda_4 < 0; \lambda_5 > 0; \lambda_6 < 0$ or $\lambda_6 > 0; \lambda_7 > 0$ (Model 2)

Because of the limited data available in Indonesia and Malaysia, a travel cost variable was not included in the demand models. Many studies in the past also did not include travel cost in the demand functions for the following reasons: 1) inconsistency and lack of data; 2) the complexity of the transportation cost structure; 3) the problem of multicollinearity between travel cost and income in the demand models (Kwack 1972; Lee 1996; Loeb 1982; O'Hagan and Harrison 1984; Uysal and Crompton 1984). The exact consequences of omitting travel cost in a demand model remain inconclusive. However, Crouch (1996), who integrated a large number of tourism demand studies through the application of meta-analysis, concluded that the omission of the travel cost variable generally did not significantly influence the estimated income and price elasticities of demand. Other excluded explanatory variables that might explain

variations in the demand for tourism in Indonesia and Malaysia were expected to be captured by the error term.

The double-log functional form of the demand equation was chosen to test the data. This model has an advantage that the resulting estimated regression coefficients in this functional form can be interpreted directly as the demand elasticities. In addition, previous researchers who have tested the suitability of different functional forms in the context of international travel demand seem to agree that the double-log form tends to provide a better fit to the data (Crouch 1994a; Lee 1996; Witt and Witt 1995).

Data Sources

Annual time series data covering the period 1980 to 1997 were used for estimating each pair of origin-destination countries. The data on GDP, CPI, exchange rate, and population were obtained from the International Financial Statistics Yearbook (1998) published by the International Monetary Fund. Data on tourist arrivals were obtained from the World Tourism Organization (1998), the United Nations Statistical Yearbook (1981 to 1985), the Statistical Information Services of Indonesia (Y. Supriatna personal communication January 30, 2000), and the Malaysian Tourism Promotion Board (N. A. Wahid personal communication February 21, 2000).

Data Analysis

The ordinary least square (OLS) multiple regression technique, which has dominated the estimation procedure in past tourism demand models, was utilized to estimate the demand for Indonesia and Malaysia as travel destinations. When multicollinearity was present, the problem was overcome partially by eliminating insignificant coefficients from the equation one at a time, and a number of regression

runs that involved different combinations of the independent variables (those that were not strongly correlated) were undertaken.

The presence of first-order serial correlation (correlation among the residual terms) was another major concern, and it was detected by Durbin-Watson (DW) statistics. When the DW test gave inconclusive results, Saunders, Sharp, and Witt (as cited by Witt and Witt 1992) suggested the rule of approximation was to assume independent errors for models with DW values within the range of 1.5 to 2.5. In cases where the error terms were found to be serially dependent in the models, the Cochrane-Orcutt (CORC) iterative procedure was used as the alternative estimating method.

## Results

### Model 1

Tables 11 and 12 give the OLS regression results of the tourism demand equations corresponding to Model 1 for Indonesia and Malaysia, respectively. Only the final reduced models are reported. Four cases (Japan, USA, UK, and Germany) for Indonesia and the Australia-Malaysia pair were re-estimated using the CORC procedure, because the DW statistics indicated the presence of first-order serial correlation at the 5% significance level. The adjusted R squared values were significant for all regression equations. Three of the six cases in Indonesia accounted for more than 90% of the variation in the dependent variable. For Malaysia, the model explained about 80% of the variation in the dependent measure in four of six cases.

Insert Tables 11 and 12

Income ($\beta_1$). For Indonesia, the estimated coefficients of the income variable were statistically significant and had positive signs in three cases (Japan, Singapore, and Australia). As expected, all estimated income elasticities were above unity, ranging from a low of 1.21 (Singapore) to a high of 3.31 (Australia). For Malaysia, the estimated income coefficients for Japan and Australia were statistically significant and had positive signs. The estimated income elasticities for Japan and Australia were 2.31 and 1.53, respectively. Although the estimated income coefficient for UK was significant at the 90% confidence interval, the sign was negative.

Relative price ($\beta_2$). For Indonesia, the estimated coefficients of relative prices were statistically significant for three of six cases (Japan, Australia, and USA), and the estimated elasticities ranged from a low of 1.09 (Australia) to a high of 2.18 (USA). However, none of the cases had the expected negative sign. For Malaysia, the estimated coefficients of the relative price variable were statistically significant for three of six cases, but only one case (USA) carried the hypothesized negative sign. The relative price elasticity for USA was 13.76, indicating that a 1% increase in relative prices would lead to a 13.76 percent decrease in American visitors to Malaysia.

Exchange rate ($\beta_3$). For Indonesia, the estimated coefficients of exchange rates were statistically significant for two of six cases (Singapore and Germany), and both had the expected positive signs. The highest elasticity was found for Singapore (2.25), indicating high sensitivity of Singaporean tourists towards changes in exchange rates between the two countries. On the other hand, the value of 0.26 for Germany indicated that it was relatively insensitive to changes in exchange rates. For Malaysia, the estimated coefficients of exchange rate were statistically significant for all cases except

Japan. However, the hypothesized sign of the estimated coefficient for the USA market was negative. For cases that exhibited the expected positive signs, the Singapore, Australia, and UK markets were exchange rate elastic, with Singapore exhibiting the largest elasticity value of 1.41. In contrast, the German market was relatively inelastic with an estimated elasticity of 0.69.

Trend ($\beta_4$). As mentioned earlier, a serious multicollinearity problem was detected between the time trend variable and the income variable in most models for both destination countries. This ultimately prevented the two predictors from entering simultaneously into the same equation. However, the trend variable included in the models for the UK-Indonesia and Germany-Indonesia pairs were statistically significant at the 99% confidence level with a positive sign. The results showed that the tourism demands from UK and Germany to Indonesia increased at rates of 15 and 11 percent per annum, respectively, because of increasing popularity over the years. For Malaysia, the trend variable was found to be statistically significant for UK only and showed that tourism demand increased at an annual rate of 8 percent as a result of increasing popularity of the country as a travel destination.

Special events ($\beta_5$ to $\beta_8$). For Indonesia, the dummy variable for the Persian Gulf War was found to be significant for Australia and Germany, but only the latter showed the expected negative sign. The dummy variable for the 1992 ASEAN year promotional campaign was included in the models for Japan, Singapore, Australia, and Germany, but was significant only for the Australia market with the expected positive sign. The dummy variable representing the 1997 environmental and Asia currency crises was significant with a negative sign for USA only. For Malaysia, the dummy variable for the

Gulf War was significant for Japan, but the sign was positive. The dummy variable representing the ASEAN year campaign was not significant in any of the origin countries. The variable representing the 1997 crises was significant for Singapore with a negative sign and for USA with a positive sign. The results for the dummy variable representing the Visit Malaysia Year campaigns in 1990 and 1994 were quite encouraging. The variable was found to be significant for Japan, Singapore, USA, and Germany, with all cases exhibiting the expected positive signs.

Model 2

Tables 13 and 14 present the findings estimated from Model 2. Three of the six markets for Indonesia (Japan, UK, and Germany) and one for Malaysia (USA), were re-estimated with the CORC method as a result of the presence of first-order serial correlation at the 95% confidence interval. All cases for Indonesia and Malaysia had adjusted R squared values that were statistically significant. Three models for Indonesia (Singapore, Australia, and USA) and two models for Malaysia (Japan and Singapore) accounted for more than 90% and 80% of the variation in the dependent variable, respectively.

Insert Tables 13 and 14

Income ($\lambda_1$). For Indonesia, the estimated coefficients for the income variable remained statistically significant for the same tourist-generating markets (Japan, Singapore, and Australia), and all had the expected positive signs and magnitudes that above unity. However, the income elasticities for Australia (6.09) and Japan (5.74) were much larger than those estimated from Model 1. For Malaysia, the estimated coefficient for income was statistically significant and had the expected positive sign for Japan only;

the income elasticity for Japan was 2.31. The estimated income coefficient for UK remained statistically significant and had a negative sign.

Relative price ($\lambda_2$). For Indonesia, the coefficients for the exchange rate-adjusted relative price variable were significant for four of six cases (Singapore, Australia, USA, and Germany), with two cases showing the expected negative signs (Singapore and Germany). The magnitudes of the coefficients for Singapore (-2.25) and Germany (-0.26) were identical to those of coefficients for the exchange rate variable estimated from Model 1. The sign of the relative price coefficient for Japan also became negative, although the coefficient was not significant. For Malaysia, the coefficients for the exchange rate-adjusted relative price variable were significant for four of six cases (Singapore, Australia, UK, and Germany), and all had the expected negative signs. The relative price elasticities ranged from a low of -0.52 for Germany to a high of -1.41 for Singapore. The magnitude of the coefficient for Singapore also was identical to the coefficient for the exchange rate variable estimated from Model 1.

Trend ($\lambda_3$). The trend variable was found to be significant for explaining the tourist flow patterns from USA and UK to Indonesia; both had positive coefficients and magnitudes of about 0.10. For Malaysia, the trend variable was statistically significant for USA, UK, and Germany. The coefficients were positive, and the magnitudes ranged from a low of 0.02 for Germany to a high of 0.08 for UK.

Special events ($\lambda_4$ to $\lambda_7$). For Indonesia, the dummy variable representing the Persian Gulf War remained significant for Germany with the expected negative sign and for Australia with a positive sign. In addition, the variable also was found to be significant for Japan and had the expected negative sign. The dummy variable that

accounted for the effect of the ASEAN year campaign was still significant and had a positive sign for Australia only. The dummy variable representing the 1997 environmental and Asian currency crises remained significant and had a negative sign for USA. For Malaysia, the dummy variable representing the 1991 Gulf War was still statistically significant for Japan and had a positive sign. The dummy variable that represented the ASEAN year campaign remained insignificant for all tourist-generating countries. The variable representing the 1997 crises was found to be significant for Singapore only, with the same sign (negative) and magnitude (-0.36) as in Model 1. The dummy variable representing the Visit Malaysia Year campaigns in 1990 and 1994 remained statistically significant for Japan, Singapore, USA, and Germany, with all showing the expected positive signs. Japan had the largest coefficient value of 0.43, followed by USA at 0.34, Germany at 0.38 and Singapore at 0.17.

## Discussion and Implications

Two models that employed different measures for the relative price variable were analyzed for each pair of origin-destination countries. However, the measure of the hybrid effect of the changes in exchange rates and the relative CPI (Model 2) seemed to be a better indicator of the relative price variable for both Indonesia and Malaysia for three reasons. First, the coefficients were more consistent with the expected negative signs, and this criterion is especially important when the regression models are used for forecasting purposes (Witt and Martin 1987). The better performance of the exchange rate-adjusted relative prices may be an indication that most tourists from the origin countries are well aware of the joint impact of the relative CPI and exchange rates.

Hence, they are driven to consider the variables collectively when making travel decisions. Secondly, the use of fewer parameters in the models improved the tolerance values and, hence, rectified the problem of multicollinearity to a certain extent. Thirdly, the estimated coefficients for the exchange rate-adjusted relative price variable (Model 2) and the exchange rate variable (Model 1) were identical in some instances for both destinations. This suggests that the effects of both factors upon tourism demand for Indonesia and Malaysia are indeed difficult, if not impossible, to separate. Therefore, the results for Model 1 should be interpreted with care, and the following discussion concentrates mainly on the findings for Model 2.

In general, the findings of the present study affirm that income, prices, and time trend provided reasonably good explanations for the demand for Indonesian and Malaysian tourism. The relatively poor fit for the models for UK-Indonesia and USA-Malaysia suggests that other explanatory variables such as travel cost and certain non-economic factors (e.g. service quality, attractions offered, and crime rates) could be equally or more important in influencing the number of tourists from these countries.

The results also reveal that tourists from the same origin country responded to changes in income and prices differently, depending upon the destination country in question. Income appeared to be an important factor that affects the travel decisions of tourists from Japan, Singapore, and Australia to Indonesia. For Malaysia, the variable was important for explaining the tourist flow pattern from Japan and UK. The negative income elasticity for the British to Malaysia could be an indication of multicollinearity between the income and trend variables in the model (a correlation coefficient of 0.96). The estimated income elasticities of demand for the rest of the cases were above unity,

confirming the view that foreign travel is a luxury product. Specifically, the Japanese and the Australians were highly income sensitive when considering Indonesia as their vacation destination. These results imply that a heavy dependence of Indonesia for tourists from Japan and Australia will make tourism in the destination country highly vulnerable to the fluctuations of the economic conditions in Japan and Australia. Knowing that the Japanese and Australians are highly income elastic has important marketing implications for the Indonesian tourism industry. For instance, instead of mass marketing, it will be more effective for the government to target specific segments that are more economically established and stable (i.e., high-yield tourists) from Japan and Australia during the period of economic downturn. The relatively high sensitivity of the Japanese and Australians with changes in their incomes also implies that Indonesia is being perceived mostly as a competitive "sun-lust" vacation destination. This is not surprising, because a majority of tourists who visit Indonesia still head directly to Bali (Anonymous 1993b 1997a; Klapwald 1997). Hence, one of the challenges facing the Indonesian government is to promote the country as a diverse destination, so that its tourism potential can be tapped fully.

The exchange rate adjusted-relative price is another important variable that exerts reasonably strong influence on the numbers of visitors from Singapore, Australia, USA, and Germany to Indonesia and from Singapore, Australia, UK, and Germany to Malaysia. The positive price elasticities for the Australians and Americans to Indonesia could indicate that multicollinearity was still present in the models (a correlation coefficient of -0.82 between the income and relative price variables for Australia and a correlation coefficient of –0.84 between the trend and relative price variables for USA).

Singaporeans, who are better informed about the changes in prices of both destinations as a result of their close proximity, are especially sensitive toward changes in the relative prices. Similarly, Australians and British traveling to Malaysia also appear to be price elastic. These results suggest the importance of the Indonesian and Malaysian governments maintaining their prices at a level that is competitive to those in the tourist-generating countries. Therefore, policy planning with respect to the price structures of Indonesian and Malaysian goods and services related to tourism will have a substantial effect on the levels of tourist arrivals from these markets. For the Germans who are price inelastic with respect to visiting Indonesia and Malaysia, other nonprice factors (i.e., type of attractions and service quality) may be equally important for increasing their tourism demand.

Changing tastes and preferences constitute an important factor for tourist flow patterns from the USA and UK to Indonesia, as well as from the USA, UK, and Germany to Malaysia. The results suggest that Indonesia and Malaysia have become increasingly popular with these origin countries over the years. Nonetheless, behind these positive trends, there is still much room for improvement. Compared to Thailand, Indonesia is still considerably behind in successfully marketing the country as a prime vacation destination for the European and North American markets (Klapwald 1997). One of the reasons is the limited budget available for marketing and promotion (Anonymous 1997a). Hence, solving the funding problem should be of primary concern to the Indonesian government, and one of the best methods is to entice the private sector into entrepreneurial alliances.

The increasing popularity of Malaysia within the German market has caused the number of German tourists to increase steadily over the years. Germany appears to offer a huge growth potential for Malaysia, because the Germans alone have accounted for more than 27% of all trips taken abroad by Europeans, and they are recognized the world's biggest spenders on travel ("German market" 1998). Thus far, a number of special interest groups within the German market have been identified by the Pacific Asia Tourism Association as the most promising segments for the Asia region ("German market" 1998). Hence, future success of attracting more Germans to Malaysia rests on the government's ability to develop tourism-related products and services that specifically target these market segments.

Several special events portrayed by the dummy variables in the present study also exerted considerable impact on international tourism demand for Indonesia and Malaysia. The Persian Gulf War in 1991 resulted a 17 percent and 15 percent reductions of Japanese and German tourists to Indonesia, respectively. The Visit ASEAN campaign in 1992, on the other hand, led to a 35 percent increase in Australian tourists to Indonesia. For Malaysia, the impact of its national promotional campaigns conducted in 1990 and 1994 were particularly effective in drawing visitors from Japan, Singapore, USA, and Germany; increases ranged from 19% to 54%. However, the net effect of the 1997 forest fires and the Asian currency crisis was a 30% reduction in Singaporeans visiting Malaysia. Singapore dollars were not impacted as seriously by the currency crisis as its neighbors such as Thailand, Malaysia, and Indonesia during the year, but the economy of Singapore was somewhat adversely affected by the turmoil.

In conclusion, income, relative prices, and changing consumer preferences appear to explain the tourist flow patterns to Indonesia and Malaysia reasonably well. Although it can be argued that the Indonesian and Malaysian governments have relatively limited control over some of these demand factors, the present study nonetheless identifies ways for the governments to further exploit their tourism sectors through appropriate adjustment. The estimates of the dummy variable that represents the national marketing campaigns for Malaysia imply the significance of promotional activities in influencing the number of tourist arrivals to the country. Future studies that model this predictor as the total promotional expenditures spent by national tourist offices of Indonesia and Malaysia will be helpful to the governments. Improvement in the empirical results also may be made by including travel costs in the models.

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Table 10

Tourist Arrivals and Annual Rates of Growth

| | Indonesia | | Malaysia | |
|---|---|---|---|---|
| Year | Number in Thousands | Percent Growth | Number in Thousands | Percent Growth |
| 1981 | 600 | - | 1679 | - |
| 1982 | 592 | -1.3 | 2093 | 24.7 |
| 1983 | 639 | 7.9 | 2750 | 31.4 |
| 1984 | 701 | 9.7 | 2779 | 1.1 |
| 1985 | 749 | 6.8 | 2933 | 5.5 |
| 1986 | 825 | 10.1 | 3217 | 3.5 |
| 1987 | 1060 | 28.8 | 3359 | 4.4 |
| 1988 | 1301 | 22.7 | 3624 | 7.9 |
| 1989 | 1626 | 25.0 | 4846 | 33.7 |
| 1990 | 2178 | 33.9 | 7446 | 53.7 |
| 1991 | 2570 | 18.0 | 5847 | -21.5 |
| 1992 | 3064 | 19.2 | 6016 | 2.9 |
| 1993 | 3403 | 11.1 | 6504 | 8.1 |
| 1994 | 4006 | 17.7 | 7197 | 10.7 |
| 1995 | 4324 | 7.9 | 7469 | 3.8 |
| 1996 | 5034 | 16.4 | 7138 | -4.4 |
| 1997 | 5185 | 3.0 | 6211 | -13.0 |

(table continues)

Table 10

Tourist Arrivals and Annual Rates of Growth

Note. Tourist arrivals were obtained from United Nations Statistical Yearbook (various issues) and World Tourism Organization (1998).

Table 11

Tourism Demand Regressions for Model 1: Destination Indonesia

| Origin country | Constant | ln (Income/P) | ln Rprice | ln Exrate | Trend | $DM_1$ | $DM_2$ | $DM_3$ |
|---|---|---|---|---|---|---|---|---|
| Japan | -35.13*** | 2.87** | 1.16** | | | | | |
| | (-3.46) | (2.83) | (2.75) | | | | | |
| Singapore | -28.72*** | 1.21** | | 2.25*** | | | | |
| | (-14.03) | (2.69) | | (5.98) | | | | |
| Australia | -36.83*** | 3.31*** | 1.09*** | -0.28 | | 0.27*** | 0.21** | |
| | (-9.03) | (7.83) | (4.55) | (-1.13) | | (3.19) | (2.51) | |
| USA | -5.86 | | 2.18*** | | | | N/A | -0.24* |
| | (-3.21) | | (7.78) | | | | | (-2.04) |
| UK | 11.83 | -2.04 | | | 0.14*** | | N/A | |
| | (0.66) | (-1.08) | | | (3.15) | | | |
| Germany | -9.70*** | | | 0.26* | 0.10*** | -0.17** | | |
| | (-11.29) | | | (1.87) | (7.09) | (-2.32) | | |

(table continue)

Table 11

Tourism Demand Regressions for Model 1: Destination Indonesia

| Origin country | Adjusted $R^2$ | DW | Estimation method |
|---|---|---|---|
| Japan | 0.93*** | 2.56 | CORC |
| Singapore | 0.97*** | 1.46 | OLS |
| Australia | 0.97*** | 1.69 | OLS |
| USA | 0.85*** | 2.01 | CORC |
| UK | 0.61*** | 1.67 | CORC |
| Germany | 0.88*** | 1.58 | CORC |

(table continues)

Table 11

Tourism Demand Regressions for Model 1: Destination Indonesia

Note. The figures in parentheses indicate t-statistics associated with the estimated coefficients.

N/A indicates that the dummy variable is not applicable in those countries.

*, **,*** indicate significance at the 90%, 95%, and 99% confidence intervals, respectively.

Table 12

Tourism Demand Regressions for Model 1: Destination Malaysia

| Origin country | Constant | ln (Income/P) | ln Rprice | ln Exrate | Trend | $DM_1$ | $DM_2$ | $DM_3$ | $DM_4$ |
|---|---|---|---|---|---|---|---|---|---|
| Japan | -29.59*** | 2.31*** | | | | 0.46* | | | 0.43** |
| | (-8.68) | (6.76) | | | | (2.14) | | | (2.65) |
| Singapore | -0.45*** | | | 1.41*** | | -0.14 | | -0.36*** | 0.17* |
| | (-7.14) | | | (6.88) | | (-1.31) | | (-3.20) | (2.06) |
| Australia | -20.68*** | 1.53** | 0.85** | 1.26*** | | | | -0.26 | |
| | (-4.86) | (3.54) | (3.12) | (6.36) | | | | (-1.90) | |
| USA | -2.86 | | -13.76** | -5.19** | | 0.34 | N/A | 0.85** | 0.41* |
| | (-1.31) | | (-2.86) | (-2.37) | | (1.28) | | (2.48) | (2.09) |
| UK | 18.26 | -2.77* | | 1.17** | 0.08** | | N/A | | |
| | (1.38) | (-1.97) | | (4.37) | (2.95) | | | | |
| Germany | -7.66*** | | 2.78* | 0.69*** | | | | | 0.39*** |
| | (-14.22) | | (2.11) | (4.07) | | | | | (3.54) |

(table continues)

Table 12

Tourism Demand Regressions for Model 1: Destination Malaysia

| Origin country | Adjusted $R^2$ | DW | Estimation method |
|---|---|---|---|
| Japan | 0.82*** | 1.45 | OLS |
| Singapore | 0.83*** | 1.86 | OLS |
| Australia | 0.82*** | 2.48 | CORC |
| USA | 0.54** | 1.74 | OLS |
| UK | 0.79*** | 2.16 | OLS |
| Germany | 0.80*** | 1.85 | OLS |

(table continues)

Table 12

Tourism Demand Regressions for Model 1: Destination Malaysia

Note. The figures in parentheses indicate t-statistics associated with the estimated coefficients.

N/A indicates that the dummy variable is not applicable in those countries.

*, **,*** indicate significance at the 90%, 95%, and 99% confidence intervals, respectively.

Table 13

Tourism Demand Regressions for Model 2: Destination Indonesia

| Origin country | Constant | ln (Income/P) | ln Exrp | Trend | $DM_1$ | $DM_2$ | $DM_3$ |
|---|---|---|---|---|---|---|---|
| Japan | -92.59*** | 5.74*** | -0.07 | | -0.18* | | |
| | (-6.75) | (6.23) | (-0.36) | | (-1.99) | | |
| Singapore | -29.44*** | 1.21** | -2.25*** | | | | |
| | (-12.85) | (2.69) | (-5.99) | | | | |
| Australia | -61.71*** | 6.09*** | 0.49** | | 0.33** | 0.30** | |
| | (-15.03) | (11.67) | (2.57) | | (2.74) | (2.51) | |
| USA | -3.73*** | | 0.72*** | 0.11*** | | N/A | -0.13* |
| | (-3.53) | | (4.68) | (13.42) | | | (-1.21) |
| UK | -7.56*** | | | 0.10*** | | N/A | |
| | (-23.10) | | | (3.90) | | | |
| Germany | -9.70*** | | -0.26* | | -0.17** | | |
| | (-11.29) | | (-1.87) | | (-2.34) | | |



(table continues)

Table 13

Tourism Demand Regressions for Model 2: Destination Indonesia

| Origin country | Adjusted $R^2$ | DW | Estimation method |
|---|---|---|---|
| Japan | 0.74*** | 1.97 | CORC |
| Singapore | 0.97*** | 1.46 | OLS |
| Australia | 0.95*** | 1.69 | OLS |
| USA | 0.96*** | 1.71 | OLS |
| UK | 0.47*** | 1.62 | CORC |
| Germany | 0.88*** | 1.58 | CORC |

(table continues)

Table 13

Tourism Demand Regressions for Model 2: Destination Indonesia

Note. The figures in parentheses indicate t-statistics associated with the estimated coefficients.

N/A indicates that the dummy variable is not applicable in those countries.

*, **, *** indicate significance at the 90%, 95%, and 99% confidence intervals, respectively.

Table 14

Tourism Demand Regressions for Model 2: Destination Malaysia

| Origin country | Constant | ln (Income/P) | ln Exrp | Trend | $DM_1$ | $DM_2$ | $DM_3$ | $DM_4$ |
|---|---|---|---|---|---|---|---|---|
| Japan | -41.09*** | 2.31*** | | | 0.46* | | | 0.43** |
| | (-8.04) | (6.76) | | | (2.14) | | | (2.65) |
| Singapore | -0.45*** | | -1.41*** | | -0.14 | | -0.36*** | 0.17* |
| | (-7.14) | | (-6.88) | | (-1.31) | | (-3.20) | (2.10) |
| Australia | -5.61*** | | -1.14*** | | -0.20 | | | |
| | (-43.40) | | (-4.51) | | (-1.43) | | | |
| USA | -8.72 | | | 0.05** | 0.20 | N/A | | 0.34** |
| | (-39.80) | | | (2.53) | (1.02) | | | (2.34) |
| UK | 17.83 | -2.89* | -1.10*** | 0.08** | | N/A | | 0.21 |
| | (1.53) | (-2.18) | (-4.28) | (3.18) | | | | (1.67) |
| Germany | -7.80*** | | -0.52** | 0.02* | 0.19 | | | 0.38*** |
| | (-10.17) | | (-2.21) | (1.84) | (0.25) | | | (3.34) |

(table continues)

Table 14

Tourism Demand Regressions for Model 2: Destination Malaysia

| Origin country | Adjusted $R^2$ | DW | Estimation method |
|---|---|---|---|
| Japan | 0.82*** | 1.45 | OLS |
| Singapore | 0.83*** | 1.86 | OLS |
| Australia | 0.82*** | 2.48 | OLS |
| USA | 0.54** | 1.74 | CORC |
| UK | 0.79*** | 2.16 | OLS |
| Germany | 0.80*** | 1.85 | OLS |

(table continues)

Table 14

Tourism Demand Regressions for Model 2: Destination Malaysia

Note. The figures in parentheses indicate t-statistics associated with the estimated coefficients.

N/A indicates that the dummy variable is not applicable in those countries.

*, **,*** indicate significance at the 90%, 95%, and 99% confidence intervals, respectively.

# CHAPTER V

# STABILITY OF INBOUND TOURISM DEMAND MODELS FOR INDONESIA AND MALAYSIA


## Abstract

The purpose of this study was to examine the stability of inbound tourism demand models for Indonesia and Malaysia as a function of increasing government intervention in tourism. Specifically, it investigated the differences in the estimated parameters before and after formation of an important tourism development organization in each destination using panel data. The major determinants included in the basic demand model were income, prices, and trend. Wald test was applied to examine the possibility of a structural change in the tourism demand between the two periods. The results supported the hypothesis postulated, and important marketing implications for the tourism industries in Indonesia and Malaysia were discussed.



Key words: structural change econometric tourism demand government Asia

Over the last three decades, econometric models have been used to estimate the demand for international tourism mostly of developed countries. Indonesia and Malaysia have not been considered. A majority of the studies used time-series data to model the travel demand for a single origin country and destination country, and their empirical results often were viewed in terms of elasticities of demand that were assumed to be constant over time. Although this assumption is appropriate for some purposes, economic theory also widely recognizes that the relationship between the dependent and independent variables, as defined in a regression framework, may experience a structural change as it evolves over time (Broemeling and Tsurumi, 1987; Ramanathan, 1998).

The purpose of this study was to examine the stability of inbound tourism demand models for Indonesia and Malaysia. The possibility of a structural shift induced by the intensifying efforts and involvement on the part of the government was of major interest. Specifically, the study examined the differences in the estimated parameters before and after formation of an important tourism development organization in each destination country. These organizations play the most important role in administering and promoting tourism development for Indonesia and Malaysia. Hence, their presence is expected to cause possible changes in the behavioral pattern of the inbound tourism demand for both destinations. The results have important marketing implications for the tourism industries in Indonesia and Malaysia.

## The Creation of Important Tourism Development Organizations

The potential of international tourism for generating foreign exchange and local employment opportunities has been recognized by the Indonesian and Malaysian

governments only since the recession of the early 1980's (Liden and Tyler, 1992; Schwarz, 1988). With the respective decreases in oil and commodity prices in Indonesia and Malaysia during the recession, the surge in tourism in the countries made this industry one of the most positive facets for reviving the nations' economies. Since then, tourism has received tremendous attention from the Indonesian and Malaysian governments.

The increased commitment of the governments to the tourism sector has been apparent by the formation of important tourism development organizations. In Indonesia, the creation of the Indonesia Tourism Promotion Board (ITPB) in 1989 made a mark on the expansion of the country's tourism to overseas markets (Cohen, 1991; Indonesia Handbook, 1999). The primary responsibilities of the ITPB include developing new markets and improving promotion programs. The international marketing campaigns of the country are staged primarily through seven Tourism Promotion Centers in Germany, USA, Japan, Singapore, Australia, UK, and Taiwan (Indonesia Handbook, 1999).

In Malaysia, the Ministry of Culture, Arts and Tourism (MOCAT) was formed in 1987 (Anonymous, 1989; Aznam, 1990; Todd, 1987). This important organization plays the primary role in formulating the country's tourism policies and is responsible for the overall tourism administration. It also acts as a coordinator among various organizations and agencies, both public and private, that participate in interrelated tourism activities. The Malaysian Tourism Promotion Board (MTPB), previously known as the Tourism Development Corporation, is a semigovernment agency under the authority of the MOCAT, has autonomy for promotion marketing and financial planning at both the domestic and international levels (Anonymous, 1997; Mohammed, 1995). Thus far, the

MTPB has opened 18 overseas offices in 16 countries, including the UK, Australia, Germany, Japan, Singapore, and USA (Anonymous, 1997; Aznam, 1990; Mohamed, 1995).

## Determinants of International Tourism Demand

An important criterion for the selection of appropriate independent variables for an international travel demand model rests upon the type of tourism involved. A majority of the previous studies have focused on vacation trips, and income and price played the most important roles in such demand functions. Additionally, the importance of changing consumer preferences underlying the theory of demand in economics also implies the possible influence of a trend factor in tourists' selection of vacation destinations.

### Income

The quantity of tourism services taken is expected to surge when income in an origin country increases, holding all other factors constant. Personal disposable income, gross national product (GNP), and gross domestic product (GDP) have been the most frequently used measures for income (Di Matteo and Di Matteo, 1993; Hui and Yuen, 1996; Jud and Joseph, 1974; Lee, 1996; Uysal and Crompton, 1984, Witt and Witt, 1992). Also, the variable has been defined commonly in per capita form to correspond to the per capita dependent measure specified. Income always has been cited as the single most important variable that provided the greatest explanatory power (Anastasopoulos, 1989; Covington et al., 1994; Crouch et al., 1992; Hui and Yuen, 1996; Jud and Joseph, 1974; Kwack, 1972; Lee, 1996; Loeb, 1982; Uysal and Crompton, 1984), and the

estimated income elasticities of demand commonly were found to be positive and above unity (greater than 1) (Crouch, 1994).

Price

The decision on an appropriate form of price in the context of international tourism demand remains unresolved, albeit it has appeared in the literature as: 1) the prices of tourist goods and services in the destination country; 2) the effect of exchange rate changes on purchasing power; and 3) the transportation costs between countries (Crouch, 1994; O'Hagan and Harrison, 1984; Witt and Witt, 1992).

Destination prices. Basic economic demand theory implies that the prices of goods and services in a destination are inversely related to the number of visits taken by the tourists, other things remaining constant. However, the destination price variable in typical travel demand models frequently has been specified in relative form to account for changes in the prices of other alternative destination(s) or domestic tourism in the origin country (cross-price effect) (Artus, 1972; Crouch et al., 1992; Jud and Joseph, 1974; Kliman, 1981; Lee, 1996). The use of a tourist price index or a similar index defined over all goods purchased by tourists, has been suggested as the best form of measurement. However, Martin and Witt (1987) who have compared the explanatory power of a tourist price index and the consumer price index (CPI) concluded that the latter is a reasonable proxy for the cost of tourism. The findings for the effect of destination prices upon foreign travel demand have varied widely. The variable was significant in many cases, but several studies found an unexpected positive sign and statistically insignificant values (Crouch, 1994; Jud and Joseph; 1974; Kwack, 1972; Little, 1980; Loeb, 1982; Martin and Witt, 1988; Uysal and Crompton, 1984).

Exchange rate. Previous researchers have considered the effect of exchange rate changes by converting the destination price variable into the currency of the tourist-generating country (Jud and Joseph, 1974; Kliman, 1981). However, certain researchers also have argued for the inclusion of the exchange rates as an independent variable in an international tourism demand model (Gray, 1966; O'Hagan and Harrison, 1984; Witt and Witt, 1992). The reason is that the rapid changes in exchange rates are perceived more readily by potential travelers than changes in the country's price levels. On the other hand, Chadee and Mieczkowski (1987) have claimed that the exchange rate variable is an equivalent measure of the changes in destination prices, and the inclusion of both may lead to serious statistical problem. Martin and Witt (1987) have found the exchange rate variable relevant for explaining the travel demand in a number of European countries, but it was not an acceptable proxy measure for the price variable on its own. Conceptually, a depreciation of a destination country's currency relative to an origin country's currency is translated as an increase in the origin country's purchasing power, and rising tourism demand is expected, all other factors remaining constant. This hypothesis has been supported by certain studies (Gerakis, 1965; Hui and Yuen, 1996; Lin and Sung, 1983; Rosensweig, 1986) but not by others (Chadee and Mieczkowski, 1987; Gray, 1966; Loeb, 1982; Summary, 1987).

Travel cost. The cost of travel from an origin country to a destination country is another important element of price, and such cost has been modeled primarily as traveling by air between origin and destination major cities. An increase in travel costs is expected to result in a decline in international travel, holding other factors constant. Many studies in the past have failed to include travel cost in the tourism demand

functions because of the difficulty in obtaining the data and the problem of multicollinearity (Lee, 1996; Loeb, 1982; Uysal and Crompton, 1984). Results regarding the impact of travel cost upon tourism demand are very uncertain. The variable was found to be significant in some studies (Covington et al., 1994; Jud and Joseph, 1974; Kliman, 1981) and insignificant in others (Gray, 1966; Little, 1980).

Trend

Some of the previous studies have attempted to account for the changes in the popularity of the destination over time as a result of changing consumer preferences by incorporating a time-trend in the demand function. The factor also intends to capture all time effects of other explanatory variables not explicitly included in the demand function (Witt and Witt, 1992). The coefficient of the trend variable is expected to be positive when the destination investigated gains popularity over the period, and negative when it loses popularity, holding other factors constant. However, the effect of the trend factor in previous tourism demand studies has not been consistent. For instance, Crouch et al. (1992) found the variable to have little measurable effect on international travel demand for Australia, whereas the effect varied from weak to moderately strong for other places (Crouch, 1994).

## Methodology

Data and Model Specification

Pooled time-series and cross-sectional (or panel) data were used to estimate the possibility of a structural shift for each of the two destination countries in this study (Indonesia and Malaysia). The data covered 18 annual time-series (1980 to 1997) for six

major target markets (Singapore, Japan, Australia, USA, UK, and Germany) for the two countries.

A structural shift was hypothesized in the tourism demand between 1980 to 1988 (Period 1) and 1989 to 1997 (Period 2) for Indonesia and between 1980 to 1986 (Period 1) and 1987 to 1997 (Period 2) for Malaysia. Period 1 was before formation of the ITPB and MOCAT, and Period 2 was after their formation. To test whether the structures for the two periods were different for Indonesia (Malaysia), the following models were estimated:

$$\ln (TA_{ijt}/ P_{it}) = \beta_0 + \beta_1 \ln(Income_{it} / P_{it}) + \beta_2 \ln Exrp_{ijt} + \beta_3 Trend_t + \lambda_1 D_1 + \ldots + \lambda_5 D_5 + \varepsilon \quad \text{(restricted model)}$$

$$\ln (TA_{ijt}/ P_{it}) = \beta_0 + \beta_1 \ln(Income_{it} / P_{it}) + \beta_2 \ln Exrp_{ijt} + \beta_3 Trend_t + \lambda_1 D_1 + \ldots + \lambda_5 D_5 + D_s[ \alpha_0 + \alpha_1 \ln(Income_{it} / P_{it}) + \alpha_2 \ln Exrp_{ijt} + \alpha_3 Trend_t + \gamma_1 D_1 + \ldots + \gamma_5 D_5] + \varepsilon \quad \text{(unrestricted model)}$$

where

| | |
|---|---|
| $TA_{ijt}$ | Tourist arrivals from origin country i to destination country j in year t |
| $P_{it}$ | Origin country i population in year t |
| $Income_{it}$ | GDP in origin country i in year t (in 1990 US dollars) |
| $Exrp_{ijt}$ | CPI in destination country j relative to CPI in origin country i in year t (with exchange rate adjustment and in 1990 US dollars) |
| $Trend_t$ | Time trend (defined as 1980=1; 1981=2 and so on) |

| | |
|---|---|
| $D_1 \ldots D_5$ | Country dummy variables (defined as Singapore=1; Japan=2; Australia=3; USA=4; UK=5) |
| $D_s$ | Dummy variable representing the presence of the ITPB or MOCAT (defined as D89 for Indonesia. D89=1 for 1989 to 1997; others=0) (defined as D87 for Malaysia. D87=1 for 1987 to 1997; others=0) |
| $\varepsilon$ | Random error term |
| $\beta, \lambda, \alpha, \gamma$ | Coefficients to be estimated |

The basic demand model (restricted model) is based on the classic demand theory of economics, which suggests that demand is affected by changes in income of consumers, prices of goods and services, and the tastes of consumers. A review of related literature and the availability of the data also were the primary sources of concern in formulating the model. The major determinants of international tourism demand for Indonesia and Malaysia therefore included measures of income, relative prices, and trend. Country dummy variables also were included in the model to allow the regression intercepts to vary. Pooled regressions with the country dummy variables are expected to provide more reliable results than those generated from pooling without allowing for intercept differences (Tremblay, 1989).

The unrestricted model was an extension of the restricted form formulated addition of a dummy variable ($D_s$) representing the presence of the ITPB or MOCAT. Because the entire demand relation might have shifted between Period 1 and Period 2, it was necessary to generate all the interaction terms by multiplying $D_s$ with each of the independent variables specified in the restricted model. Thus, the null hypothesis in this study is stated as follows:

$\alpha_0 = \alpha_1 = \alpha_2 = \alpha_3 = \gamma_1 = \ldots = \gamma_5 = 0$

Tourism demand in this study was measured as the per capita visits from the six tourist generating-countries to Indonesia (Malaysia). This was done to remove the effect of the increases in tourist arrivals due merely to population growth. The GDP in US dollars was used to represent the income variable. Data for the GDP were defined in real per capita form to account for the effects of population growth and inflation in each origin country. The relative price variable was measured as the CPI of the destination country relative to the CPI of the origin country, with an exchange rate adjustment applied to this general definition. The final form of the relative price variable then was converted to US dollars for the purpose of standardization. In a preliminary time-series study concerning the tourist flow patterns to Indonesia and Malaysia from the six tourist-generating countries, relative CPI (same as defined above) was used in addition to exchange rates and an exchange rate adjusted relative CPI to represent the price variable (Tan et al., 2000). The results indicated that the latter form of measurement was a better indicator of the price variable for both destination countries. Hence, no attempt was made to include exchange rate as a separate independent variable in this study. Also, the present measure of the relative price variable considered only domestic tourism in the origin country and the trip to Indonesia (Malaysia) as the principal choices for the potential travelers. Substitute destination(s) for Indonesia and Malaysia were not readily apparent.

Because of the limited data available in Indonesia and Malaysia, a travel cost variable was not included in the demand model. The exact consequence of omitting travel cost in a demand model remains inconclusive. However, Crouch (1996), who

integrated a large number of tourism demand studies through the application of meta-analysis, concluded that the omission of the travel cost variable generally did not seem to significantly influence the estimated income and price elasticities of demand. Other excluded explanatory variables that might explain variations in the demand for tourism in Indonesia and Malaysia were expected to be captured by the error term.

The double-log (or log-log) functional form of the demand equation was chosen to test the data. This model is very popular in estimating demand functions in economics (Ramanathan, 1998). It also has an added advantage that the resulting estimated regression coefficients could be interpreted directly as the demand elasticities. In addition, previous researchers who have tested the suitability of different functional forms in the context of international travel demand seem to agree that the double-log form tends to provide a better fit to the data (Crouch, 1994; Lee, 1996; Witt and Witt, 1995).

Sources of Data

The data on GDP, CPI, exchange rate, and population were obtained from the International Financial Statistics Yearbook (1998) published by the International Monetary Fund. Data on tourist arrivals were obtained from the World Tourism Organization's statistical database (1998), the United Nations Statistical Yearbook (1981 to 1985), the Statistical Information Services of Indonesia (Y. Supriatna, personal communication, January 30, 2000), and the Malaysian Tourism Promotion Board (N. A. Wahid, personal communication, February 21, 2000).

Data Analysis

The ordinary least square (OLS) multiple regression technique, which has dominated the estimation procedure in past tourism demand equations, was utilized to estimate the aggregated demand models for Indonesia and Malaysia separately. The Wald test (or a joint F-test) was applied to examine the possibility of a structural change in the tourism demand between Period 1 and Period 2 for Indonesia and Malaysia.

Multicollinearity (approximately linear relationships among explanatory variables) was identified based on a pair-wise product moment correlation matrix and the value of the tolerance for each estimated regression coefficient. The problem partially was overcome by eliminating insignificant coefficients from the equation one at a time.

Heteroscedasticity (unequal variance scatter) and first-order serial correlation (correlation among the residual terms) were other concerns in this study. The major diagnostic tools used to detect these problems were the Breush-Godfrey Lagrange Multiplier (LM) test for serial correlation and the Breusch-Pagan LM test for heteroscedasticity. Feasible Generalized Least Square (FGLS) procedure was used as the alternative estimating method when the problem(s) was (were) present.

## Results

Table 15 presents the results of the final estimated models for Indonesia and Malaysia. The Wald test procedure indicated that structural shifts did occur in the tourism demand for Indonesia and Malaysia. The final estimated models associated with the two periods are given by the unrestricted equations presented in Table 15. The estimated coeffficients for Period 1 were determined by setting D89 (for Indonesia) or

D87 (for Malaysia) in the unrestricted models to zero. The relation for Period 2 was obtained by setting D89 or D87 to 1 and combining terms for the same variables. For ease of interpretation, Table 16 gives a summary of these separate regression relations for the two periods.

Insert Tables 15 and 16

Indonesia

For the restricted model, the estimated coefficient of the income variable was statistically significant and had a positive sign. The estimated income elasticity was above unity (1.55). The trend variable had a magnitude of 0.07 with a positive sign, indicating an average annual increase of about 7 percent in the demand for Indonesia from the six tourist-generating countries. The results also indicated a significant differential in Indonesia's per capita visitor arrivals, because the intercept shifters for all country dummy variables were statistically significant. The positive coefficients suggested that tourism demand for Indonesia was greater in Singapore, Japan, Australia, and UK than in Germany.

As hypothesized, all the coefficients estimated for the restricted model were not constant. Although the income variables were statistically significant and carried the expected positive sign for both periods, tourism demand for Indonesia was income elastic for Period 1, but inelastic for Period 2. The effect of the relative price variable was not statistically significant for either period. A possible explanation might be the near perfect collinearity between lnExrpD89 and D89 (correlation coefficient of -0.9998) as well as between lnExrpD89 and ln[(Income/P)D89] (correlation coefficient of -0.9995). The trend variable was statistically significant for Period 2 only. Its coefficient suggested that

tourism demand for Indonesia increased at an average rate of about 12 percent per annum from 1989 to 1997. The highly significant country dummy variables also indicated a different demand structure for each country. The demands for tourism from Singapore, Japan, Australia, and UK were significantly greater than that from Germany for both periods. However, the rates of increases for Singapore, Australia, and UK were greater for Period 1. On the other hand, the number of tourist arrivals from USA showed a larger decrease for Period 2.

Malaysia

For the restricted model, the coefficient of the income variable was statistically significant, and the sign was positive. As expected, the estimated income elasticity was above unity (1.49). The relative price variable was statistically significant and had a negative sign. The relative price elasticity of -0.55 indicated that a 1 percent decrease in relative prices would lead to a 0.55 percent increase in tourism demand for Malaysia. The results for the country dummy variables also suggested that the demand for tourism in Malaysia had a different structure for each country. Specifically, tourism demands from Singapore, Japan, Australia, and UK were statistically greater than that from Germany.

Similar to the findings for Indonesia, all the coefficients estimated from the restricted model were not constant. Table 16 shows that tourism demand for Malaysia was highly income elastic for Period 1 (4.29) but was inelastic for Period 2 (0.15). The effect of the relative price variable was statistically significant only for Period 2, with an estimated elasticity of -0.61, whereas the trend effect was significantly different for the two periods. The marginal effect of the trend variable was -0.11 for Period 1 whereas it

was 0.03 for Period 2. The results suggested that the average annual decrease in the tourism demand for Malaysia because of its decreasing popularity was about 10 percent for Period 1. However, Malaysia was slowly gaining popularity in Period 2; the demand for tourism increased at an average rate of 3 percent per annum. Results for the country dummy variables indicated that the demand for tourism in Malaysia was not the same across the six tourist-generating countries. Similar to the findings for Indonesia, the demands from Singapore, Japan, Australia, and UK were significantly greater than that from Germany for both periods, but the rates of increase for Singapore, Australia, and UK were significantly larger for Period 1.

## Discussion and Implications

The results of this study support the hypothesis that the estimated tourism demand elasticities for Indonesia and Malaysia vary as a function of increasing government intervention. In this study, the growing participation of the governments in tourism was examined through the formation of an important tourism development organization in each country.

Income is an important factor that affects the decisions of tourists to travel to Indonesia and Malaysia, but their respective income elasticities have declined substantially over time. This drastic drop implies that the tourism sectors in Indonesia and Malaysia have advanced into a more standardized stage of a product life-cycle model related to international tourism. This model depicts four distinct programmatic stages of a product (e.g., a vacation package in the context of international tourism) (Jud, 1971; Witt et al., 1991). It suggests that the income elasticity of demand tends to be high in the

new product stage but decreases when the product becomes more standardized (Broemeling and Tsurumi, 1987; Jud, 1971). Hence, such a change in the product cycle can be attributed to the active participation of the Indonesian and Malaysian governments in stimulating the demand for, and in managing the supply of, tourism in each destination.

The income inelastic nature of the aggregated markets after formation of the ITPB and MOCAT also implies that Indonesian and Malaysian tourism has become less of a luxury. In other words, the tourism industries of Indonesia and Malaysia have become increasingly "recession proof", but they also are unlikely to benefit as much from the income growth in the tourist-generating markets. Hence, future tourism policies and promotion efforts in Indonesia and Malaysia should encourage longer stays or more expenditures per visit by tourists from these origin countries.

The relative price variable (with an exchange rate adjustment) is another important determinant that affected tourists to Malaysia in the period after formation of the MOCAT. The significant but inelastic nature of the price variable suggests that a price reduction in Malaysia will cause the total receipts from tourism to decrease, assuming constant average expenditures per visit generated from the six origin markets. Under this condition, other nonprice factors (e.g., service quality and the type of attractions offered) may be more effective in stimulating the demand from the aggregated markets to the destination country. However, the price elasticity of demand in Malaysia is likely to increase over time, and this reasoning again is based on the product life-cycle model. As the Malaysian tourism industry advances to a more standardized stage in the cycle, prices of tourism-related products and services should become more competitive as

a result of economies of scale and the new competitors in the marketplace (both factors ultimately will drive the prices down) (Witt et al., 1991). When the tourists in Malaysia become increasingly price sensitive, controls of prices related to tourism goods and services should be of primary concern to the Malaysian government, which is eager to further expand its international tourism. Nevertheless, the newly adopted exchange rate policy in Malaysia that pegs the Malaysian currency to the U.S. dollar is expected to affect its level of tourist arrivals considerably, if the price elasticity of demand in the country continues to rise. This is because future increases in the dollar will cause Malaysian tourism to lose its price competitiveness with other major markets that are not tied to the U.S. currency. Hence, tourism pricing in Malaysia also requires a careful consideration of the competitors' exchange rate policies, as well as those from the USA.

Changing tastes and preferences are other important factors affecting the tourist flow patterns in Indonesia and Malaysia. Specifically, tourism in both destinations has gained popularity with the six tourist-generating countries in the period after formation of the ITPB in Indonesia and the MOCAT in Malaysia. The effectiveness of the information disseminated by their respective tourism offices likely has been one of the main contributors to the growing number of tourists to Indonesia and Malaysia. This assertion generally is supported by Kointarangkul (1990), who found that information about a destination that the tourists received has an important effect on their decisions to visit a country.

In the future, the provision of accurate information to the public as well as travel trade intermediaries will continue to be an important responsibility of the Indonesian and Malaysian governments in their efforts to attract more tourists. At the same time, the

importance of image promotion should not be understated, considering that a growing number of tourists has begun to perceive a homogenization of cultures in some destinations in Asia (Cockerell, 1997). Additionally, the increasing popularity of Indonesia and Malaysia as vacation destinations also suggests the need for more government intervention and supervision in a few areas: 1) the protection and conservation of nonrenewable resources and other natural and cultural assets in the countries, 2) the unbalanced tourism growth among the different regions of Indonesia or Malaysia, and 3) the shortage of skilled personnel in the tourism industry. The urgent need to develop the required human resources for the tourism industry generally has been recognized among the ASEAN member countries (including Indonesia and Malaysia) as a consequence of the rapid growth of international tourists ("Plan of action", 1996). Hence, future government initiatives aiming at improving tourism education and training will be especially crucial for Indonesia or Malaysia to sustain its competitive advantage.

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Table 15

Results of Wald Tests for Structural Stability

| Country and model | Constant | ln (Income/ P) | ln Exrp | Trend | $D_1$ | $D_2$ | $D_3$ | $D_4$ | $D_5$ | $D_6$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Indonesia | | | | | | | | | | |
| [d]Unrestricted | -37.09 | 2.99 | N/S | N/S | 6.68 | 0.48 | 3.32 | -0.88 | 1.43 | 28.78 |
| | (-19.56) | (15.64) | | | (41.07) | (9.20) | (48.63) | (-17.96) | (14.30) | (7.28) |
| [d]Restricted | -22.96 | 1.55 | N/S | 0.07 | 5.58 | 0.41 | 2.74 | -1.06 | 0.77 | |
| | (-6.81) | (4.48) | | (7.73) | (20.84) | (2.63) | (17.62) | (-6.68) | (3.45) | |
| Malaysia | | | | | | | | | | |
| [e]Unrestricted | -49.74 | 4.29 | N/S | -0.11 | 10.32 | 1.10 | 3.80 | -0.73 | 2.67 | 39.97 |
| | (-4.86) | (4.11) | | (-3.70) | (12.63) | (10.21) | (12.01) | (-8.44) | (7.02) | (3.25) |
| [e]Restricted | -22.68 | 1.49 | -0.55 | N/S | 7.96 | 0.95 | 2.77 | -0.81 | 1.67 | |
| | (-6.64) | (4.24) | (-3.02) | | (29.16) | (7.85) | (19.41) | (-6.50) | (11.45) | |

(table continues)

Table 15

Results of Wald Tests for Structural Stability

| Country and model | ln (Income/ P) x $D_s$ | Ln Exrp x $D_s$ | Trend x $D_s$ | $D_1$ x $D_s$ | $D_2$ x $D_s$ | $D_3$ x $D_s$ | $D_4$ x $D_s$ | $D_5$ x $D_s$ | Estimation method |
|---|---|---|---|---|---|---|---|---|---|
| Indonesia | | | | | | | | | |
| [d]Unrestricted | -2.95 | N/S | 0.11 | -1.59 | 0.17 | -1.09 | -0.27 | -1.15 | FGLS |
| | (-7.33) | | (15.10) | (-6.78) | (1.98) | (-9.72) | (-3.78) | (-7.58) | |
| [d]Restricted | | | | | | | | | FGLS |
| Malaysia | | | | | | | | | |
| [e]Unrestricted | -4.14 | -0.61 | 0.14 | -2.93 | N/S | -1.43 | N/S | -1.32 | FGLS |
| | (-3.30) | (-1.91) | (4.29) | (-3.27) | | (-3.08) | | (-3.08) | |
| [e]Restricted | | | | | | | | | FGLS |

(table continues)

Table 15

Results of Wald Tests for Structural Stability

| Country and model | [a]Heteroscedasticity | [b]Autocorrelation | ESS | [c]Wald test |
|---|---|---|---|---|
| Indonesia | | | | |
| [d]Unrestricted | 51.83 | 1.29 | 2.02 | 17.75 |
| | $p < 0.01$ | $p > 0.10$ | | $p < 0.01$ |
| [d]Restricted | 25.82 | 2.97 | 4.73 | |
| | $p < 0.01$ | $p < 0.10$ | | |
| Malaysia | | | | |
| [e]Unrestricted | 35.27 | 22.93 | 5.58 | 4.45 |
| | $p < 0.01$ | $p < 0.01$ | | $p < 0.01$ |
| [e]Restricted | 24.27 | 7.26 | 7.44 | |
| | $p < 0.01$ | $p < 0.1$ | | |

(table continues)

Table 15

Results of Wald Tests for Structural Stability

Note. $D_1$ to $D_5$ represent country dummy variables (1 = Singapore, 2 = Japan, 3 = Australia, 4 = USA, 5 = UK).

$D_s$ represent the structural shift ($D_s$ = D89 for Indonesia and $D_s$ = D87 for Malaysia).

The figures in parentheses indicate z-statistics associated with the estimated coefficient.

N/S indicates that the variable is not significant in the model ($p > 0.10$).

[a] Refers to the Breusch-Godfrey LM statistics.

[b] Refers to the Breusch-Pagan LM statistics.

[c] Refers to the F-statistics.

[d] All coefficients for the independent variables have $p < 0.01$ except $D_2 \times D_s$ ($p < 0.05$).

[e] All coefficients for the independent variables have $p < 0.01$ except ln Exrp x $D_s$ ($p < 0.10$).

Table 16

Regression Models for the Two Periods

| Country and Period | Constant | ln (Income/ P) | ln Exrp | Trend | $D_1$ | $D_2$ | $D_3$ | $D_4$ | $D_5$ |
|---|---|---|---|---|---|---|---|---|---|
| Indonesia | | | | | | | | | |
| [a]Period 1 | -37.09 | 2.99 | N/S | N/S | 6.68 | 0.48 | 3.32 | -0.88 | 1.43 |
| [b]Period 2 | -8.31 | 0.04 | N/S | 0.11 | 5.09 | 0.65 | 2.24 | -1.15 | 0.28 |
| Malaysia | | | | | | | | | |
| [c]Period 1 | -49.74 | 4.29 | N/S | -0.11 | 10.32 | 1.10 | 3.80 | -0.73 | 2.67 |
| [d]Period 2 | -9.77 | 0.15 | -0.61 | 0.03 | 7.39 | 1.10 | 2.36 | -0.73 | 1.35 |

Note. $D_1$ to $D_5$ represent country dummy variables (1 = Singapore, 2 = Japan, 3 = Australia, 4 = USA, 5 = UK).

[a]1980 to 1988, [b]1989 to 1997.

[c]1980 to 1986, [d]1987 to 1997.

# CHAPTER VI

# SUMMARY, CONCLUSIONS, AND IMPLICATIONS

## Summary

The major purpose of this study was to examine the primary factors that influence the flow patterns of tourists to Indonesia and Malaysia based on the theory of demand in economics. The objectives of the study were two-fold: 1) to estimate the tourism demand models from six important origin countries (Japan, Singapore, Australia, USA, UK, and Germany) to Indonesia and Malaysia using annual time-series data from 1980 to 1997; and 2) to estimate the stability of the inbound tourism demand models for Indonesia and Malaysia as a function of increasing government intervention in tourism using panel data. The second objective specifically examined the differences in the estimated parameters before and after the formation of an important tourism development organization in the respective destination country (ITPB for Indonesia and MOCAT for Malaysia).

Tourism demand in this study was examined as the per capita visits from the six tourist generating countries to Indonesia and Malaysia. The basic demand model used to accomplish the objectives is based on the classic demand theory of economics. The theory suggests that demand is affected by changes in consumers' income, prices of goods and services, and the tastes of consumers. Dummy variables also were included in the models to account for 1) a number of special events for objective one; and 2) country differences for objective two.

Due to the complex nature of the price variable, two models that employed different indicators for the variable were estimated for objective one. Model 1 used exchange rates in addition to the relative CPI as the indicators for prices, whereas Model

2 included the exchange rate adjusted-relative CPI into the equation. The measure of the hybrid effect of the changes in exchange rates and the relative CPI (Model 2) seemed to be a better indicator for the price variable for Indonesia and Malaysia for three reasons. First, the coefficients were found to be more consistent with the expected negative signs. Secondly, the use of fewer parameters in Model 2 helped to rectify the problem of multicollinearity to a certain extent. Thirdly, the estimated coefficients for the exchange rate adjusted-relative price variable (Model 2) and the exchange rate variable (Model 1) were noted to be identical in some instances for both destinations. This suggests that the effects of changes in exchange rates and relative prices upon tourism demand for Indonesia and Malaysia are indeed difficult, if not impossible, to separate. Therefore, the results estimated from Model 1 should be interpreted with care, and the following summarizes the main findings related to Model 2.

As indicated by the generally higher adjusted R squared values, Model 2 gave a better explanation for the demand for Indonesia as a travel destination. Three cases for Indonesia (Singapore, Australia, and USA) and three cases for Malaysia (Japan, Singapore, and UK) accounted for more than 90 percent and 80 percent of the variations in the dependent variable, respectively.

The income variable was found to be statistically significant for the tourists from Japan, Singapore, and Australia to Indonesia, and those from Japan and UK to Malaysia. Except for the British to Malaysia, the income coefficients for all cases had the expected positive signs, indicating that the higher the per capita income, the more people visited Indonesia or Malaysia. The magnitude of income elasticities were found to be in excess

of unity in all cases. This implies that international tourism demand for Indonesia or Malaysia was sensitive to tourist income.

With respect to the price variable, the results showed that it was significant to determine the tourism demand from Singapore, Australia, USA, and Germany to Indonesia. The variable also was found to be statistically important for explaining tourism demand from Singapore, Australia, UK, and Germany to Malaysia. Except in two cases for Indonesia (Australia and USA), all estimated coefficients for the relative price variable had the expected negative signs, indicating that the greater (lower) cost of living in the destination country relative to the origin country, the lower (greater) tourism demand. However, only Singaporeans to Indonesia and Malaysia, as well as the Australians and British to Malaysia, were found to be price elastic.

The trend variable was found to be statistically significant for explaining the tourist flow patterns from USA and UK to Indonesia, as well as those from USA, UK, and Germany to Malaysia. All estimated coefficients for the trend variable were positive.

In relation to the dummy variables representing the special events, the impact of the "Visit Malaysia Year" campaigns in 1990 and 1994 were the most encouraging. The variable was found to be statistically significant for Japan, Singapore, USA, and Germany, with all cases exhibiting the expected positive signs.

The results of this study also support the hypothesis which postulates that the estimated tourism demand elasticities for Indonesia and Malaysia vary as a function of increasing government intervention (objective 2). The following summarizes the main findings for the separate regression relations before (Period 1) and after (Period 2) formation of the ITPB in Indonesia and the MOCAT in Malaysia.

For Indonesia, the income variable was found to be statistically significant and carried the expected positive sign for both periods. However, the aggregated demand for the destination was income elastic for Period 1, but inelastic for Period 2. The effect of the exchange rate adjusted-relative price variable was not statistically significant for either period. The trend variable was found to be significant for Period 2 only, with its estimated coefficient exhibiting a positive sign. The highly significant country dummy variables also indicated a different demand structure for each country. The demands for tourism from Singapore, Japan, Australia, and UK were significantly greater than that from Germany for both periods. However, the rates of increases for Singapore, Australia, and UK were greater for Period 1. On the other hand, the number of tourist arrivals from USA showed a larger decrease for Period 2.

Similar to the findings for Indonesia, tourism demand for Malaysia was highly income elastic for Period 1, but inelastic for Period 2. The relative price variable was only found to be statistically significant for Period 2, with the expected negative sign and an estimated elasticity that was less than unity. The trend variable was found to be significantly different for the two periods. The estimated coefficient for the variable was negative for Period 1, and positive for Period 2. Results for the country dummy variables indicated that the demand for tourism in Malaysia was not the same across the six tourist-generating countries. Similar to the findings for Indonesia, the demands from Singapore, Japan, Australia, and UK were significantly greater than that from Germany for both periods, but the rates of increase for Singapore, Australia, and UK were significantly larger for Period 1.

## Conclusions and Implications

### Estimation of Inbound Tourism Demand Models Using Time-Series Data

In general, the findings of the present study affirm that income, prices and time trend are the basic factors determining tourism demand for Indonesia and Malaysia. The results of the exchange rate adjusted-relative price variable also implies the significance of the exchange rates in affecting tourists' decisions to both destinations. Except for the British to Indonesia as well as the Australians and Americans to Malaysia, these factors provide reasonably good explanations for the demand for Indonesian and Malaysian tourism from all tourist-generating countries considered in the study. The relatively poor fit for the models for UK-Indonesia, Australia-Malaysia, and USA-Malaysia suggests that other explanatory variables such as travel cost and certain non-economic factors (i.e. service quality, attractions offered, and crime rates) can be equally or more important in influencing the number of tourists from these countries.

The findings of the study also reveal that tourists from the same origin country may respond to changes in income and prices differently, depending upon the destination country in question. Income, appears to be an important factor that affects the travel decisions of tourists from Japan, Singapore, and Australia to Indonesia. For Malaysia, the variable is important for explaining the tourist flow patterns from Japan and UK. Considering the size of the estimated income coefficients that were in excess of unity, it should be expected that any changes in the incomes of tourists would have a more than proportional impact on the number of arrivals in Indonesia and Malaysia. This result is consistent with previous findings which rendered most researchers to conclude that foreign travel is a luxury item.

Nonetheless, the income variable for the British to Malaysia was found to exhibit the negative sign which indicated a decreasing number of tourists with increasing income, all other variables being held constant. Although it is possible for an "inferior" tourist destination to exhibit a negative income elasticity, the presence of multicollinearity between the income and trend variables (as indicated by a correlation coefficient of 0.96) might be a better explanation in this case. As mentioned earlier, multicollinearity between the time trend and income variables was detected in most of the full models for both destination countries. This ultimately prevented the two predictors from entering into the same equations simultaneously. Hence, despite the theoretical importance of the income variable on tourism demand, this study was not able to capture its significance in all origin-destination country pairs.

In cases where the income variable was found to be statistically significant and had the expected positive sign, the estimated income elasticities for the Japanese and Australians to Indonesia were found to be considerably high. This indicates that the Japanese and Australians were highly income sensitive when considering Indonesia as their vacation destination. Hence, a heavy dependence of Indonesia for tourists from Japan and Australia will make the destination country highly vulnerable to the fluctuations of the economic conditions in Japan and Australia. On the other hand, tourists from Singapore to Indonesia were less responsive to income changes. This indicates that the Indonesian tourism sector will not benefit as much from the income growth in Singapore. The results also show that the Japanese tourists to Malaysia were quite responsive to changes in their incomes. Therefore, the tourism industry in Malaysia

is likely to benefit when the Japanese economy is doing well, but it is less likely to be "recession proof".

With respect to the possibility of controlling or influencing the income variable by the destination country, it can be argued that no government policies of Indonesia and Malaysia can determine the level or the rate of growth of the income in the tourist-generating countries. However, knowing the income elasticity of tourism demand for an origin country allows the Indonesian and Malaysian governments to make adjustments in their marketing strategies and tourism policies accordingly. For instance, during the period of economic downturn, the Indonesian government may want to consider concentrating their resources on smaller segments that are more economically established and stable (e.g. the high-yield tourists), particularly from Japan and Australia. During years of prosperity, and if the trend of increasing incomes in Japan and Australia can be assumed to continue, it will be necessary for the Indonesian government to provide adequate supply (i.e. transportation and accommodation) to meet the increasing demand. At the same time, preventive measures should be taken to help protect the environment and heritage of Indonesia, which may be at a higher risk due to the increasing number of tourists to the country. The same reasoning can be applied to the Japanese tourists to Malaysia. With respect to the Singapore tourists to Indonesia, the Indonesian government may want to compensate for the slower growth rate by encouraging the Singaporeans to stay longer or to spend more money per visit.

It is also customary for international vacation destinations to be distinguished as "sunlust" (sun and sea) or "wanderlust" (culture and heritage) (Kanellakis, 1971), and the former destinations are believed to be more income elastic than the latter destinations

(Summary, 1983). In this study, the relatively high sensitivity of the Japanese and Australian tourists to Indonesia toward changes in their incomes therefore implies that Indonesia is being perceived mostly as a competitive "sun-lust" vacation destination. This is not surprising as a majority of tourists who visit Indonesia still head directly to Bali (Anonymous, 1993, 1997; Jarrett, 1997; Klapwald, 1997). This distinction should be of particular interest to the Indonesian public and private authorities who are involved in planning the development of the tourism industry. Knowing the expectations and the preferences of its actual and potential visitors is especially important for the Indonesian government's promotional activities and the weighing of priorities in the financing of related investment projects. Another implication for this finding is related to the many cultural attractions that Indonesia has to offer. Indonesia actually consists of 13,600 islands, 25 main languages, and 300 ethnic groups of vastly different religions, prosperity, education, and cultures (Schansman, 1991). Considering this multitude of attractions in Indonesia, one of the immediate challenges facing the government is to promote the country as a diverse destination so that its tourism potential can be tapped fully.

In addition to income, the regression results indicate that tourists to Indonesia and Malaysia also tended to be quite responsive to changes in prices. In this study, two models that employed different measures for the relative price variable were used, and the exchange rate adjusted-relative CPI (Model 2) was noted as a better indicator for the price variable for both destinations. This may be an indication that most tourists from the origin countries are well aware of the joint impact of the relative CPI and exchange rates.

Hence, they are driven to consider the variables collectively when making travel decisions.

The relative price variable is specifically important in determining tourists from Singapore, Australia, USA and Germany to Indonesia, as well as those from Singapore, Australia, UK, and Germany to Malaysia. Except for the Australians and Americans to Indonesia, the higher prices in Indonesia or Malaysia relative to the origin country are associated with a decreasing number of tourist arrivals to the destination.

Multicollinearity is likely to be responsible for the positive coefficients of the relative price variable for Australia and USA to Indonesia. The result for Australia show that the relative price variable was negatively correlated with income by a factor of -0.82. For USA, a correlation of -0.84 was found between the relative price variable and the time trend term.

Singapore tourists, who are better informed about the changes in prices of both destinations as a result of their close proximity, are especially sensitive toward changes in the relative prices. Similarly, Australians and British traveling to Malaysia also appear to be highly price elastic. These results suggest the importance of the Indonesian and Malaysian governments maintaining their prices at a level that is competitive to those in the tourist-generating countries.

In view of the relative price variable that comprised changes in the CPI in Indonesia or Malaysia, foreign exchange rates, and the CPI in the country of origin of the tourist, the first and second components are indeed subject to considerable control by the Indonesian or Malaysian government. However, with respect to the CPI in the destination country, it is doubtful that the Indonesian or Malaysian government will

attempt to influence the general level of prices in order to influence tourism, considering the relative size of international tourism in the national economy. The same can be argued about the exchange rates between the destination and origin countries. Given that the changes on any monetary, fiscal, and exchange rate policies will have an impact on other economic aggregates of the Indonesian or Malaysia economy, the manipulation of foreign exchange rates merely for tourism purposes is very unlikely in either destination. Hence, it seems to be more reasonable for the Indonesian and Malaysian governments to entice more price-sensitive tourists by controlling the prices of their tourism related goods and services. Examples of such efforts include the controls over rising hotel prices, tax incentives to hotels and domestic airlines, and exemption of custom duties and sales tax on tourism related products.

The German market which is price inelastic with respect to visiting Indonesia and Malaysia is expected to increase less than proportionally with the reduction in prices. Therefore, other non-price factors may be more important to increase tourism demand from the Germans. One of such factors concerns the kind of attractions available in Indonesia and Malaysia. The Pacific Asia Tourism Association (PATA) recently has identified a number of special interest groups within the German market as the most promising segments for the Asia Pacific region ("German market", 1998). These include surfing, sailing, diving, golf, health and fitness, canoeing, cruising, as well as fishing and hiking vacations. There is also a growing interest and concern for the environment within the German travelers. Hence, future success of attracting more German tourists to Indonesia and Malaysia rests on the governments' ability to develop tourism related products and services that specifically targeted at these market segments.

Changing tastes and preferences constitute an important factor for tourist flow patterns from USA and UK to Indonesia, as well as from USA, UK, and Germany to Malaysia. The results indicate that the demand for vacation trips from USA and UK has increased at a rate of about 12 percent and 10 percent per annum, respectively, as a result of increasing popularity of Indonesia to the markets. Similarly, the increasing popularity of Malaysia as a vacation travel destination has caused the number of American, British, and German arrivals to the country to increase at a yearly rate of 5 percent, 8 percent, and 2 percent, respectively.

Nonetheless, behind these positive trends, there is still much room for improvement. As compared to Thailand, Indonesia is still considerably behind in successfully marketing the country as a prime vacation destination for the European and North American markets (Klapwald, 1997). One of the major reasons is the limited budget available for marketing and promotion. For instance, the 1997 annual budget for promoting tourism in Indonesia amounted to a meager six million US dollars, and the funds still had to be spread thinly among the head office in Jakarta and seven tourist promotion offices overseas (Anonymous, 1997). In addition, it is also customary for the city and provincial governments in Indonesia to collect but withhold a two percent tax from restaurants and hotels that are originally meant for funding the tourism promotional activities abroad (Jarrett, 1997). Hence, solving the funding problem should be of primary concern to the Indonesian government, and one of the best methods is to entice the private sector into entrepreneurial alliances with the government. Only then can Indonesia fully exploit the opportunity that currently lies within the American and British markets through stepping up its promotional efforts.

For Malaysia, the demand for vacation trips from the American and the British tourists has increased but at a slow pace over the 17-year period. The lack of medium cost accommodation and inadequate transport facilities have been noted frequently as the main reasons for Malaysia's failure to market itself as the prime destination for the European and North American markets (Field, 1994; Liden and Tyler, 1992). At the same time, the shortage of skilled personnel in the tourism sector has become the most pressing problem for Malaysia to provide quality services to its western tourists who tend to spend a lot, but also demand a lot (Goldsmith and Zahari, 1994; Liden and Tyler, 1992; Soledad, 1996). This has been primarily the result of a lack of coordination between the Malaysian government and its private agencies who are responsible for the training activities in the tourism industry. For instance, the required numbers of qualified personnel in tourism, and hence, the needs for additional educational establishments, are usually based on guesswork instead of a formal communication between the Malaysian Tourism Promotion Board (MTPB) and the Malaysian Association of Hotels (Goldsmith and Zahari, 1994). To complicate the matter, most training units in tourism in Malaysia do not have the capacity to produce graduates in number sufficient to meet the increasing demand for trained personnel (Goldsmith and Zahari, 1994). Hence, in addition to improving the infrastructure specific to tourism, addressing the problems of creating synergy between the public and private sectors in Malaysia, in terms of the provision of training facilities, remains a major challenge to the destination country.

With respect to the special events portrayed by the dummy variables, the results varied considerably among the 12 origin-destination country pairs. The Persian Gulf War in 1991 resulted in a 17 percent and 15 percent reduction of tourists from Japan and

Germany to Indonesia, respectively. On the contrary, the war did not seem to deter the Japanese from visiting Malaysia, neither did it prevent an increasing number of Australian tourists to Indonesia. The "Visit ASEAN year" campaign in 1992, on the other hand, led to a 35 percent increase in the Australian tourists to Indonesia. For Malaysia, the impacts of its national promotional campaigns conducted in 1990 and 1994 were particularly effective in drawing visitors from Japan, Singapore, USA, and Germany. These important marketing efforts were responsible for 18 percent to 53 percent increases in the demand for Malaysia from the four tourist-generating markets. However, the net effect of the 1997 forest fires and the Asian currency crisis was a 31 percent reduction of Singaporean tourists to Malaysia. Despite the fact that Singapore dollars were not as seriously impacted by the currency crisis as its neighbors (Thailand, Malaysia, and Indonesia) during the year, the economy of Singapore was somehow adversely affected by the turmoil.

Stability of Inbound Tourism Demand Models Using Panel Data

The important role of the Indonesian and Malaysian governments in the development of tourism through the destination organization sector was discussed in Chapter I. The period during which the ITPB is in existence in Indonesia, and the MOCAT in Malaysia, is indicative of the influence that the respective government policies and activities may exert on the tourism industry. The direct participation of such organizations in both destinations is therefore possible to cause a structural shift in the inbound tourism demand models for Indonesia and Malaysia. The results of this study support the validity of this hypothesis.

Income is an important factor that affects the travel decisions of tourists to Indonesia and Malaysia, but their respective income elasticity has declined substantially over time. The income inelastic nature of the aggregated markets after formation of the ITPB or MOCAT implies that Indonesian or Malaysian tourism has become less of a luxury. If this trend continues, a one percent increase in the incomes of the origin countries is expected to lead to less than a proportional increase in the number of tourists to Indonesia or Malaysia. Similarly, any income reduction in the origin countries will have a less than proportional effect on the destination country's tourist arrivals.

The tremendous decrease in the income elasticities after formation of the ITPB in Indonesia and the MOCAT in Malaysia can be explained in conjunction with the classic product life-cycle model. The model depicts four distinct programmatic stages (development, growth, maturity, and decline) in international trade involving a new consumer product (e.g. a vacation package in the context of international tourism) (Jud, 1971; Witt et al., 1991). The development phase of the cycle tends to be unstandardized, as it is the innovative stage when a new product is first created (Witt et al., 1991). In the growth stage, the product becomes more standardized on both the demand side (as travelers begin to follow trend) and on the supply side (as the logistics become routine). The demand for the product is more likely to exhibit high income elasticity in the new product stage, but declines in the standardized stage (Broemeling and Tsurumi, 1987; Jud, 1971). Much of the cause of the product cycle has been attributed to the changing structure of production and the increased availability of the item over time, which tend to reduce the product's fad appeal (Jud, 1971; Witt et al., 1991). Hence, the drastic drop in the income elasticities observed in this study suggests that the tourism sectors in

Indonesia and Malaysia have advanced into a more standardized stage in a typical product cycle in international tourism. Such a change can be attributed to the active participation of the ITPB in Indonesia and the MOCAT in Malaysia in stimulating the demand for, and in managing the supply of, tourism in each destination. With the finding indicating that the tourism industry in Indonesia and Malaysia is unlikely to benefit much from the income growth in the tourist-generating countries, future tourism policies and promotion efforts that encourage longer stays or higher expenditures per visit should therefore take precedence.

Unlike the income variable, the results of the exchange rate adjusted-relative price variable differ somewhat for Indonesia and Malaysia. The variable was not found to be statistically significant for explaining the aggregated tourist flow pattern to Indonesia before or after formation of the ITPB. A possible explanation for the insignificant relative price variable for the latter period is the near perfect collinearity between the following variables: lnexrpD89 and D89 (a correlation coefficient of -0.9998) as well as between lnexrpD89 and lnincD89 (a correlation coefficient of -0.9995).

For Malaysia, the relative price variable is an important determinant that affects tourists to the country only after formation of the MOCAT. The significant but inelastic nature of the price variable suggests that a price reduction in Malaysia will cause the total receipts from tourism to decrease, assuming constant average expenditure per visit generated from the six origin markets. Under this condition, other non-price factors (e.g. service quality and the type of attractions offered) may be more effective in stimulating the demand from the aggregated markets to the destination country. However, the price elasticity of demand in Malaysia is likely to increase over time, and this reasoning again

is based on the product life-cycle model. As the Malaysian tourism industry advances to a more standardized stage in the cycle, prices of tourism-related products and services are believed to become more competitive as a result of economies of scale and the new competitors in the market place (both factors will ultimately drive the prices down) (Witt et al., 1991). When the tourists in Malaysia become increasingly price sensitive, controls of prices related to tourism goods and services should be of primary concern to the Malaysian government, which is eager to further expand its international tourism. Nevertheless, the newly adopted exchange rate policy in Malaysia that pegs the Malaysian currency to the U.S. dollar is expected to affect its level of tourist arrivals considerably, if the price elasticity of demand in the country continues to rise. This is because future increases in the dollar will cause Malaysian tourism to lose its price competitiveness with its major markets that are not tied to the U.S. currency. Hence, tourism pricing in Malaysia also requires a careful consideration of the competitors' exchange rate policies, as well as those from the USA.

Changing tastes and preferences are other important factors affecting the tourist flow patterns in Indonesia and Malaysia. Specifically, tourism in both destinations has gained popularity with the six tourist-generating countries in the period after formation of the ITPB in Indonesia and the MOCAT in Malaysia. The effectiveness of the information disseminated by their respective tourism offices likely has been one of the main contributors to the growing number of tourists to Indonesia and Malaysia. This assertion generally is supported by Kointarangkul (1990), who found that information about a destination (Thailand) that the tourists (from Germany, Japan, UK, and USA) received has an important effect on their decisions to visit a country. Although a number

of motivating forces (e.g. the shorter work hours and longer vacation periods, the availability of credit cards, and the demographic changes in travelers) generally have been noted for the growing popularity in international travel, none of these factors will lead the tourists specifically to Indonesia or Malaysia. Therefore, it is reasonable to argue that without having some information about a destination country, these motivating forces behind international travel are insufficient by themselves to be effective.

In the future, the provision of appropriate information will continue to be an important responsibility of the Indonesian and Malaysian governments to attract more tourists to the countries. All activities conducted under information services should aim to provide accurate and efficient service for the public as well as travel trade intermediaries for all inquiries concerning travel to Indonesia or Malaysia. Examples of such activities include public inquiry and information offices on all aspects of the country, customs, climate, food, clothing, hotel lists and tariffs, local tours and guides, and places and events of particular interest. At the same time, the importance of image promotion should not be understated, considering that a growing number of tourists has begun to perceive a homogenization of cultures in some destinations in Asia (Cockerell, 1997). In view of the fierce competition in global tourism, it is therefore critical for Indonesia or Malaysia to define a distinctive market identity that can set the country apart from the other competitive nations primarily in the same region. This can be achieved by focusing on the countries' great varieties in both culture and nature. Additionally, marketing campaigns aiming to rid the countries of their sex tourism and violence images should be emphasized. The success of such efforts will very much depend upon the support that the Indonesian and Malaysian governments gained from the private sectors.

It is also believed that these pressing issues could be addressed more effectively through cooperation with the rest of the ASEAN members.

The role of the Indonesian and Malaysian governments in facilitating tourism development will continue to be critical, but the growing popularity of Indonesia and Malaysia as vacation destinations also requires an increasing government intervention and supervision in a few areas. One of these areas is the protection and conservation of the non-renewable resources and other natural and cultural assets in the countries. As international tourism grows, some of these resources can be endangered or vanish altogether. For instance, in Indonesia, because of the speed with which development companies construct hotels and recreation areas, there seems to be insufficient control available for waste collection and sewage treatment systems (Schansman, 1991). Similarly, some areas of Malaysia, especially along the coastal zones of the offshore islands (i.e. Penang, Tioman, and Langkawai), have been experiencing environmental problems derived from sewage disposal and siltation due primarily to rapid tourism development (Mohamed, 1995). Hence, continuous government planning and management is important to maintain the long term sustainability of the resources in both destination countries.

Beyond this responsibility, policy measures to relieve unbalanced tourism growth among the different regions of Indonesia or Malaysia should be of paramount importance if international tourists continue to grow. There are still abundant opportunities for the Indonesian and Malaysian governments to each market the country as a diverse destination. For instance, the relatively undeveloped east coast of West Malaysia as well as East Malaysia (Sabah and Sarawak) constitute wildlife, jungles and mountains that are

ideal locations for increasingly popular eco-tourism (King, 1994). Similarly, most regions in East Indonesia are also virgin territories with a huge potential for eco-tourism and marine tourism (Anonymous, 1997).

The standards and training in the tourism industry is another important issue that deserves the fullest attention from the Indonesian and Malaysian governments. Tourism is a human resource intensive industry and the availability of skilled and trained manpower is a crucial element in the success of any tourism development plan. More importantly, people in the industry are expected to make a vital difference in the attractiveness of Indonesia or Malaysia as a travel destination. The urgent need to develop the required human resources for the tourism industry generally has been recognized among the ASEAN member countries as a consequence of the rapid growth of international tourists ("Plan of action", 1996). However, the tourism sectors in Indonesia and Malaysia still suffer from an acute shortage of skilled personnel. Witt et al. (1991) acknowledged that although the climate of the world today is in favor of self-regulation and privatization, some government control in this aspect is necessary especially in a fragmented industry like tourism. Hence, government initiatives aiming at improving tourism education and training are not only crucial for Indonesia or Malaysia to sustain its competitive advantage, but also for the upgrading of skills to address the demand for improved levels of quality, service, and professionalism in the tourism industry.

## Future Studies

The major focus of this study was to examine the primary economic factors, income and price, that influence the flow patterns of tourists to Indonesia and Malaysia. Similar to previous studies that attempted to model tourism demand, the present study relied solely on the use of secondary data for its analysis. The dependent variable, demand, was only examined as the tourist numbers. As noted by Crouch (1994, p.589), "data on tourist numbers is generally more reliable but is likely to be less responsive to the determinants as tourists are able to alter both their length of stay or daily expenditure as they adjust to changing circumstances." Hence, future studies that investigate demand in terms of such measures as the expenditures and the length of stay will give further insights into this area of study. With regards to the annual time-series models estimated, the dummy variable that represents the national marketing campaigns for Malaysia suggests the significance of the promotional activities in influencing the number of tourists to the country. Future studies that model this predictor as the total promotional expenditures spent by national tourist offices of Indonesia and Malaysia will be insightful to the governments. Improvement in the empirical results may also be made by including travel costs in the models presented.

The results of this study also suggest that apart from income and destination prices, other explanatory variables can be equally or more important in influencing the number of tourists from some of the origin countries examined to Indonesia and Malaysia. Hence, it is believed that a field survey to gather the perceptions of tourists about such factors in the future will help to supplement the findings from the secondary data analysis. Finally, the present study was only concerned with the inbound tourism

demand in Indonesia and Malaysia. Future studies that investigate the outbound behavior of tourists in both destinations will give additional insights to the balance-of-payment issues and strategic planning of the tourism industry.

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# APPENDIX A

# RAW DATA USED IN ESTIMATING THE DEMAND FOR INTERNATIONAL TOURISM IN INDONESIA AND MALAYSIA

Table A-1

Tourist Arrivals to Indonesia

| Year | Singapore | Japan | Australia | USA | UK | Germany |
|---|---|---|---|---|---|---|
| 1980 | 61200 | 61700 | 82000 | 52600 | 41200 | 31500 |
| 1981 | 69500 | 66600 | 94700 | 52300 | 49200 | 32100 |
| 1982 | 79300 | 72900 | 87300 | 52200 | 55200 | 28500 |
| 1983 | 95100 | 84800 | 84000 | 57200 | 55800 | 30600 |
| 1984 | 100900 | 92400 | 95600 | 60100 | 59100 | 33700 |
| 1985 | 142466 | 89221 | 122982 | 58599 | 36854 | 31657 |
| 1986 | 153504 | 103023 | 122404 | 65199 | 42144 | 37384 |
| 1987 | 243240 | 134445 | 133151 | 64497 | 49020 | 49364 |
| 1988 | 347493 | 157929 | 147836 | 67061 | 62068 | 58981 |
| 1989 | 450281 | 194366 | 163327 | 74777 | 77557 | 71445 |
| 1990 | 621069 | 263398 | 179483 | 101399 | 91897 | 87455 |
| 1991 | 710706 | 290907 | 219306 | 101344 | 101062 | 94596 |
| 1992 | 809144 | 394693 | 234723 | 125337 | 117826 | 118244 |
| 1993 | 858034 | 377551 | 287850 | 154762 | 133209 | 133245 |
| 1994 | 1017155 | 476456 | 305209 | 169061 | 162304 | 160325 |
| 1995 | 1046533 | 486278 | 320494 | 155111 | 165788 | 167653 |
| 1996 | 1300482 | 665711 | 380475 | 197923 | 145268 | 167607 |
| 1997 | 1354458 | 639211 | 458733 | 181967 | 170238 | 187384 |

Table A-2

Tourist Arrivals to Malaysia

| Year | Singapore | Japan | Australia | USA | UK | Germany |
|---|---|---|---|---|---|---|
| 1980 | 312900 | 113500 | 110500 | 69700 | 90500 | 27541 |
| 1981 | 612700 | 129600 | 102500 | 56400 | 92500 | 30630 |
| 1982 | 1644333 | 130600 | 88400 | 54700 | 84200 | 30434 |
| 1983 | 1801480 | 135900 | 95300 | 64100 | 106200 | 25100 |
| 1984 | 1938395 | 101800 | 69100 | 36600 | 54800 | 24600 |
| 1985 | 2078531 | 117250 | 78628 | 40317 | 63120 | 24368 |
| 1986 | 2156034 | 133305 | 84647 | 46116 | 80473 | 27589 |
| 1987 | 2220196 | 142039 | 90129 | 49127 | 85806 | 28884 |
| 1988 | 2330089 | 162189 | 99430 | 56246 | 100736 | 31980 |
| 1989 | 3142660 | 209783 | 75902 | 78054 | 111391 | 47128 |
| 1990 | 4569127 | 507764 | 149136 | 146120 | 196320 | 71774 |
| 1991 | 3261029 | 405172 | 121856 | 105168 | 166768 | 63759 |
| 1992 | 3744698 | 259504 | 120853 | 78793 | 142082 | 47324 |
| 1993 | 4051562 | 255607 | 121694 | 85861 | 154521 | 58384 |
| 1994 | 4469748 | 286330 | 128420 | 94403 | 157929 | 70164 |
| 1995 | 4537347 | 330725 | 136300 | 97547 | 164489 | 63915 |
| 1996 | 4157757 | 353204 | 150026 | 101056 | 166588 | 63508 |
| 1997 | 3489032 | 308902 | 129262 | 94649 | 162079 | 57722 |

Table A-3

Population

| Year | Singapore | Japan | Australia | USA | UK | Germany |
|---|---|---|---|---|---|---|
| 1980 | 2.41 | 116.81 | 14.70 | 227.76 | 56.33 | 61.54 |
| 1981 | 2.44 | 117.66 | 14.92 | 229.94 | 56.35 | 61.66 |
| 1982 | 2.47 | 118.48 | 15.18 | 232.17 | 56.31 | 61.60 |
| 1983 | 2.41 | 119.31 | 15.39 | 234.30 | 56.35 | 61.38 |
| 1984 | 2.44 | 120.08 | 15.56 | 236.37 | 56.51 | 61.13 |
| 1985 | 2.48 | 120.84 | 15.79 | 238.49 | 56.68 | 60.97 |
| 1986 | 2.52 | 121.49 | 16.02 | 240.68 | 56.85 | 61.01 |
| 1987 | 2.55 | 122.09 | 16.26 | 242.84 | 57.01 | 61.09 |
| 1988 | 2.85 | 122.58 | 16.53 | 245.06 | 57.16 | 61.42 |
| 1989 | 2.93 | 123.09 | 16.81 | 247.34 | 57.36 | 61.99 |
| 1990 | 3.02 | 123.48 | 17.06 | 249.91 | 57.56 | 63.23 |
| 1991 | 3.09 | 123.92 | 17.28 | 252.62 | 57.81 | 79.98 |
| 1992 | 3.18 | 124.32 | 17.49 | 255.39 | 58.01 | 80.57 |
| 1993 | 3.26 | 124.67 | 17.67 | 258.13 | 58.19 | 81.19 |
| 1994 | 3.36 | 124.96 | 17.85 | 260.60 | 58.39 | 81.41 |
| 1995 | 3.47 | 125.20 | 18.07 | 263.04 | 58.61 | 81.66 |
| 1996 | 3.61 | 125.76 | 18.31 | 265.45 | 58.78 | 81.90 |
| 1997 | 3.74 | 126.07 | 18.53 | 267.90 | 58.20 | 82.06 |

Note.

Data were in millions.

Table A-4

GDP in Constant 1990 National Currency

| Year | Singapore | Japan | Australia | USA | UK | Germany |
|---|---|---|---|---|---|---|
| 1980 | 33583 | 287441 | 272.12 | 4447.2 | 423.49 | 1945.0 |
| 1981 | 36809 | 297728 | 282.04 | 4525.7 | 418.03 | 1947.7 |
| 1982 | 39335 | 307141 | 280.40 | 4428.2 | 425.25 | 1927.4 |
| 1983 | 42556 | 315438 | 283.22 | 4600.5 | 440.89 | 1960.9 |
| 1984 | 46092 | 328893 | 304.55 | 4885.3 | 451.13 | 2016.3 |
| 1985 | 45345 | 345285 | 317.90 | 5040.0 | 468.07 | 2062.3 |
| 1986 | 46388 | 354358 | 324.97 | 5186.8 | 488.12 | 2110.2 |
| 1987 | 50900 | 368906 | 339.17 | 5346.4 | 511.62 | 2139.2 |
| 1988 | 56821 | 391808 | 352.16 | 5556.7 | 537.22 | 2216.0 |
| 1989 | 62289 | 410282 | 367.05 | 5697.4 | 548.94 | 2297.3 |
| 1990 | 67879 | 430040 | 371.44 | 5743.8 | 551.12 | 2429.4 |
| 1991 | 72811 | 446371 | 366.56 | 5687.9 | 540.31 | 2750.6 |
| 1992 | 77394 | 450981 | 376.37 | 5842.7 | 537.45 | 2811.1 |
| 1993 | 85473 | 452339 | 391.15 | 5973.1 | 548.62 | 2778.5 |
| 1994 | 94352 | 455254 | 412.22 | 6183.6 | 572.30 | 2858.0 |
| 1995 | 102652 | 461951 | 429.04 | 6308.4 | 587.91 | 2913.7 |
| 1996 | 109787 | 480073 | 445.47 | 6482.7 | 600.81 | 2952.4 |
| 1997 | 118078 | 484379 | 458.50 | 6728.8 | 621.10 | 3012.0 |

Note.

GDP for Singapore was measured in millions whereas GDP for the rest of the origin countries was measured in billions.

Table A-5

Consumer Price Indices (CPI)

| Year | Singapore | Japan | Australia | USA | UK | Germany | Malaysia | Indonesia |
|---|---|---|---|---|---|---|---|---|
| 1980 | 80.0 | 81.6 | 45.8 | 63.1 | 53.0 | 77.2 | 72.9 | 43.9 |
| 1981 | 86.6 | 85.6 | 50.3 | 69.6 | 59.3 | 82.2 | 80.0 | 49.3 |
| 1982 | 89.9 | 88.0 | 55.9 | 73.9 | 64.4 | 86.4 | 84.6 | 53.9 |
| 1983 | 91.0 | 89.7 | 61.6 | 76.2 | 67.4 | 89.3 | 87.7 | 60.3 |
| 1984 | 93.4 | 91.7 | 64.0 | 79.5 | 70.7 | 91.4 | 91.2 | 66.6 |
| 1985 | 93.8 | 93.5 | 68.3 | 82.4 | 75.0 | 93.5 | 91.5 | 69.8 |
| 1986 | 92.5 | 94.1 | 74.5 | 83.9 | 77.6 | 93.4 | 92.2 | 73.8 |
| 1987 | 93.0 | 94.2 | 80.8 | 87.0 | 80.8 | 93.6 | 92.4 | 80.7 |
| 1988 | 94.4 | 94.9 | 86.7 | 90.5 | 84.7 | 94.7 | 94.8 | 87.2 |
| 1989 | 96.7 | 97.0 | 93.2 | 94.9 | 91.3 | 97.4 | 97.4 | 92.8 |
| 1990 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1991 | 103.4 | 103.3 | 103.2 | 104.2 | 105.9 | 103.6 | 104.4 | 109.4 |
| 1992 | 105.8 | 105.1 | 104.2 | 107.4 | 109.8 | 108.9 | 109.3 | 117.7 |
| 1993 | 108.2 | 106.4 | 106.1 | 110.0 | 111.5 | 113.7 | 113.2 | 132.4 |
| 1994 | 111.5 | 107.1 | 108.1 | 113.4 | 114.3 | 116.8 | 117.4 | 145.2 |
| 1995 | 113.5 | 107.0 | 113.2 | 116.6 | 118.2 | 119.0 | 123.6 | 158.2 |
| 1996 | 115.0 | 107.2 | 116.1 | 120.0 | 121.1 | 120.7 | 128.0 | 168.7 |
| 1997 | 117.3 | 109.0 | 116.4 | 122.9 | 124.9 | 122.9 | 131.4 | 188.3 |

Table A-6

Nominal Exchange Rates in National Currency per US Dollar

| Year | Singapore | Japan | Australia | USA | UK | Germany | Malaysia | Indonesia |
|---|---|---|---|---|---|---|---|---|
| 1980 | 2.1412 | 226.74 | 0.8776 | 1 | 0.4299 | 1.8177 | 2.1769 | 627.0 |
| 1981 | 2.1127 | 220.54 | 0.8701 | 1 | 0.4931 | 2.2600 | 2.3041 | 631.8 |
| 1982 | 2.1400 | 249.08 | 0.9829 | 1 | 0.5713 | 2.4266 | 2.3354 | 661.4 |
| 1983 | 2.1131 | 231.51 | 1.1082 | 1 | 0.6592 | 2.5533 | 2.3213 | 909.3 |
| 1984 | 2.1331 | 237.52 | 1.1369 | 1 | 0.7483 | 2.8459 | 2.3436 | 1025.9 |
| 1985 | 2.2002 | 238.54 | 1.4269 | 1 | 0.7714 | 2.9440 | 2.4830 | 1110.6 |
| 1986 | 2.1774 | 168.52 | 1.4905 | 1 | 0.6817 | 2.1715 | 2.5814 | 1282.6 |
| 1987 | 2.1060 | 144.64 | 1.4267 | 1 | 0.6102 | 1.7974 | 2.5196 | 1643.8 |
| 1988 | 2.0124 | 128.15 | 1.2752 | 1 | 0.5614 | 1.7562 | 2.6188 | 1685.7 |
| 1989 | 1.9503 | 137.96 | 1.2618 | 1 | 0.6099 | 1.8800 | 2.7088 | 1770.1 |
| 1990 | 1.8125 | 144.79 | 1.2799 | 1 | 0.5603 | 1.6157 | 2.7049 | 1842.8 |
| 1991 | 1.7276 | 134.71 | 1.2835 | 1 | 0.5652 | 1.6595 | 2.7501 | 1950.3 |
| 1992 | 1.6290 | 126.65 | 1.3600 | 1 | 0.5664 | 1.5617 | 2.5474 | 2029.9 |
| 1993 | 1.6158 | 111.20 | 1.4704 | 1 | 0.6658 | 1.6533 | 2.5741 | 2087.1 |
| 1994 | 1.5274 | 102.21 | 1.3667 | 1 | 0.6529 | 1.6228 | 2.6243 | 2160.8 |
| 1995 | 1.4174 | 94.06 | 1.3486 | 1 | 0.6335 | 1.4331 | 2.5044 | 2248.6 |
| 1996 | 1.4100 | 108.78 | 1.2773 | 1 | 0.6403 | 1.5048 | 2.5159 | 2342.3 |
| 1997 | 1.4848 | 120.99 | 1.3439 | 1 | 0.6032 | 1.7341 | 2.8132 | 2909.4 |

# APPENDIX B

## TRANSFORMED DATA USED IN ESTIMATING THE DEMAND FOR INTERNATIONAL TOURISM IN INDONESIA AND MALAYSIA

Table B-1

Per Capita Tourist Arrivals to Indonesia

| Year | Singapore | Japan | Australia | USA | UK | Germany |
|---|---|---|---|---|---|---|
| 1980 | 0.0254 | 0.0005 | 0.0056 | 0.0002 | 0.0007 | 0.0005 |
| 1981 | 0.0285 | 0.0006 | 0.0063 | 0.0002 | 0.0009 | 0.0005 |
| 1982 | 0.0321 | 0.0006 | 0.0058 | 0.0002 | 0.0010 | 0.0005 |
| 1983 | 0.0395 | 0.0007 | 0.0055 | 0.0002 | 0.0010 | 0.0005 |
| 1984 | 0.0414 | 0.0008 | 0.0061 | 0.0003 | 0.0010 | 0.0006 |
| 1985 | 0.0574 | 0.0007 | 0.0078 | 0.0002 | 0.0007 | 0.0005 |
| 1986 | 0.0609 | 0.0008 | 0.0076 | 0.0003 | 0.0007 | 0.0006 |
| 1987 | 0.0954 | 0.0011 | 0.0082 | 0.0003 | 0.0009 | 0.0008 |
| 1988 | 0.1219 | 0.0013 | 0.0089 | 0.0003 | 0.0011 | 0.0010 |
| 1989 | 0.1537 | 0.0016 | 0.0097 | 0.0003 | 0.0014 | 0.0012 |
| 1990 | 0.2057 | 0.0021 | 0.0105 | 0.0004 | 0.0016 | 0.0014 |
| 1991 | 0.2300 | 0.0023 | 0.0127 | 0.0004 | 0.0017 | 0.0012 |
| 1992 | 0.2544 | 0.0032 | 0.0134 | 0.0005 | 0.0020 | 0.0015 |
| 1993 | 0.2632 | 0.0030 | 0.0163 | 0.0006 | 0.0023 | 0.0016 |
| 1994 | 0.3027 | 0.0038 | 0.0171 | 0.0006 | 0.0028 | 0.0020 |
| 1995 | 0.3016 | 0.0039 | 0.0177 | 0.0006 | 0.0028 | 0.0021 |
| 1996 | 0.3602 | 0.0053 | 0.0208 | 0.0007 | 0.0025 | 0.0020 |
| 1997 | 0.3622 | 0.0051 | 0.0248 | 0.0007 | 0.0029 | 0.0023 |

Table B-2

Per Capita Tourist Arrivals to Malaysia

| Year | Singapore | Japan | Australia | USA | UK | Germany |
|---|---|---|---|---|---|---|
| 1980 | 0.1298 | 0.0010 | 0.0075 | 0.0003 | 0.0016 | 0.0004 |
| 1981 | 0.2511 | 0.0011 | 0.0069 | 0.0002 | 0.0016 | 0.0005 |
| 1982 | 0.6657 | 0.0011 | 0.0058 | 0.0002 | 0.0015 | 0.0005 |
| 1983 | 0.7475 | 0.0011 | 0.0062 | 0.0003 | 0.0019 | 0.0004 |
| 1984 | 0.7940 | 0.0008 | 0.0044 | 0.0002 | 0.0010 | 0.0004 |
| 1985 | 0.8381 | 0.0010 | 0.0050 | 0.0002 | 0.0011 | 0.0004 |
| 1986 | 0.8556 | 0.0011 | 0.0053 | 0.0002 | 0.0014 | 0.0005 |
| 1987 | 0.8707 | 0.0012 | 0.0055 | 0.0002 | 0.0015 | 0.0005 |
| 1988 | 0.8176 | 0.0013 | 0.0060 | 0.0002 | 0.0018 | 0.0005 |
| 1989 | 1.0726 | 0.0017 | 0.0045 | 0.0003 | 0.0019 | 0.0008 |
| 1990 | 1.5130 | 0.0041 | 0.0087 | 0.0006 | 0.0034 | 0.0011 |
| 1991 | 1.0553 | 0.0033 | 0.0071 | 0.0004 | 0.0029 | 0.0008 |
| 1992 | 1.1776 | 0.0021 | 0.0069 | 0.0003 | 0.0024 | 0.0006 |
| 1993 | 1.2428 | 0.0021 | 0.0069 | 0.0003 | 0.0027 | 0.0007 |
| 1994 | 1.3303 | 0.0023 | 0.0072 | 0.0004 | 0.0027 | 0.0009 |
| 1995 | 1.3076 | 0.0026 | 0.0075 | 0.0004 | 0.0028 | 0.0008 |
| 1996 | 1.1517 | 0.0028 | 0.0082 | 0.0004 | 0.0028 | 0.0008 |
| 1997 | 0.9329 | 0.0025 | 0.0070 | 0.0004 | 0.0028 | 0.0007 |

Table B-3

Per Capita GDP in Constant 1990 National Currency

| Year | Singapore | Japan | Australia | USA | UK | Germany |
|---|---|---|---|---|---|---|
| 1980 | 13935 | 2460757 | 18512 | 19526 | 7518 | 31605 |
| 1981 | 15086 | 2530410 | 18903 | 19682 | 7418 | 31588 |
| 1982 | 15925 | 2592345 | 18472 | 19073 | 7552 | 31289 |
| 1983 | 17658 | 2643852 | 18403 | 19635 | 7824 | 31947 |
| 1984 | 18890 | 2738949 | 19573 | 20668 | 7983 | 32984 |
| 1985 | 18284 | 2857373 | 20133 | 21133 | 8258 | 33825 |
| 1986 | 18408 | 2916767 | 20285 | 21551 | 8586 | 34588 |
| 1987 | 19961 | 3021591 | 20859 | 22016 | 8974 | 35017 |
| 1988 | 19937 | 3196345 | 21304 | 22675 | 9399 | 36079 |
| 1989 | 21259 | 3333187 | 21835 | 23035 | 9570 | 37059 |
| 1990 | 22476 | 3482669 | 21773 | 22983 | 9575 | 38422 |
| 1991 | 23563 | 3602090 | 21213 | 22516 | 9346 | 34391 |
| 1992 | 24338 | 3627582 | 21519 | 22878 | 9265 | 34890 |
| 1993 | 26219 | 3628291 | 22136 | 23140 | 9428 | 34222 |
| 1994 | 28081 | 3643198 | 23094 | 23728 | 9801 | 35106 |
| 1995 | 29583 | 3689704 | 23743 | 23983 | 10031 | 35681 |
| 1996 | 30412 | 3817374 | 24329 | 24422 | 10221 | 36049 |
| 1997 | 31572 | 3842143 | 24744 | 25117 | 10672 | 36705 |

Table B-4

Relative Prices: CPI in Indonesia Relative to CPI in Origin Country

| Year | Singapore | Japan | Australia | USA | UK | Germany |
|---|---|---|---|---|---|---|
| 1980 | 0.5488 | 0.5380 | 0.9585 | 0.6957 | 0.8283 | 0.5686 |
| 1981 | 0.5693 | 0.5759 | 0.9801 | 0.7083 | 0.8314 | 0.5998 |
| 1982 | 0.5996 | 0.6125 | 0.9642 | 0.7294 | 0.8370 | 0.6238 |
| 1983 | 0.6626 | 0.6722 | 0.9789 | 0.7913 | 0.8947 | 0.6753 |
| 1984 | 0.7131 | 0.7263 | 1.0406 | 0.8377 | 0.9420 | 0.7287 |
| 1985 | 0.7441 | 0.7465 | 1.0220 | 0.8471 | 0.9307 | 0.7465 |
| 1986 | 0.7978 | 0.7843 | 0.9906 | 0.8796 | 0.9510 | 0.7901 |
| 1987 | 0.8677 | 0.8567 | 0.9988 | 0.9276 | 0.9988 | 0.8622 |
| 1988 | 0.9237 | 0.9189 | 1.0058 | 0.9635 | 1.0295 | 0.9208 |
| 1989 | 0.9597 | 0.9567 | 0.9957 | 0.9779 | 1.0164 | 0.9528 |
| 1990 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1991 | 1.0580 | 1.0591 | 1.0601 | 1.0499 | 1.0331 | 1.0560 |
| 1992 | 1.1125 | 1.1199 | 1.1296 | 1.0959 | 1.0719 | 1.0808 |
| 1993 | 1.2237 | 1.2444 | 1.2479 | 1.2036 | 1.1874 | 1.1645 |
| 1994 | 1.3022 | 1.3557 | 1.3432 | 1.2804 | 1.2703 | 1.2432 |
| 1995 | 1.3938 | 1.4785 | 1.3975 | 1.3568 | 1.3384 | 1.3294 |
| 1996 | 1.4670 | 1.5737 | 1.4531 | 1.4058 | 1.3931 | 1.3977 |
| 1997 | 1.6053 | 1.7275 | 1.6177 | 1.5321 | 1.5076 | 1.5321 |

Table B-5

Relative Prices: CPI in Malaysia Relative to CPI in Origin Country

| Year | Singapore | Japan | Australia | USA | UK | Germany |
|---|---|---|---|---|---|---|
| 1980 | 0.9113 | 0.8934 | 1.5917 | 1.1553 | 1.3755 | 0.9443 |
| 1981 | 0.9238 | 0.9346 | 1.5905 | 1.1494 | 1.3491 | 0.9732 |
| 1982 | 0.9410 | 0.9614 | 1.5134 | 1.1448 | 1.3137 | 0.9792 |
| 1983 | 0.9637 | 0.9777 | 1.4237 | 1.1509 | 1.3012 | 0.9821 |
| 1984 | 0.9764 | 0.9945 | 1.4250 | 1.1472 | 1.2900 | 0.9978 |
| 1985 | 0.9755 | 0.9786 | 1.3397 | 1.1104 | 1.2200 | 0.9786 |
| 1986 | 0.9968 | 0.9798 | 1.2376 | 1.0989 | 1.1881 | 0.9872 |
| 1987 | 0.9935 | 0.9809 | 1.1436 | 1.0621 | 1.1436 | 0.9872 |
| 1988 | 1.0042 | 0.9989 | 1.0934 | 1.0475 | 1.1192 | 1.0011 |
| 1989 | 1.0072 | 1.0041 | 1.0451 | 1.0263 | 1.0668 | 1.0000 |
| 1990 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| 1991 | 1.0097 | 1.0106 | 1.0116 | 1.0019 | 0.9858 | 1.0077 |
| 1992 | 1.0331 | 1.0400 | 1.0489 | 1.0177 | 0.9954 | 1.0037 |
| 1993 | 1.0462 | 1.0639 | 1.0669 | 1.0291 | 1.0152 | 0.9956 |
| 1994 | 1.0529 | 1.0962 | 1.0860 | 1.0353 | 1.0271 | 1.0051 |
| 1995 | 1.0890 | 1.1551 | 1.0919 | 1.0600 | 1.0457 | 1.0387 |
| 1996 | 1.1130 | 1.1940 | 1.1025 | 1.0667 | 1.0570 | 1.0605 |
| 1997 | 1.1202 | 1.2055 | 1.1289 | 1.0692 | 1.0520 | 1.0692 |

Table B-6

Exchange Rate Adjusted-Relative Prices (in National Currency): CPI in Indonesia

Relative to CPI in Origin Country

| Year | Singapore | Japan | Australia | USA | UK | Germany |
|---|---|---|---|---|---|---|
| 1980 | 0.00187 | 0.19455 | 0.00134 | 0.00111 | 0.00057 | 0.00165 |
| 1981 | 0.00190 | 0.20104 | 0.00135 | 0.00112 | 0.00065 | 0.00215 |
| 1982 | 0.00194 | 0.23066 | 0.00143 | 0.00110 | 0.00072 | 0.00229 |
| 1983 | 0.00154 | 0.17115 | 0.00119 | 0.00087 | 0.00065 | 0.00190 |
| 1984 | 0.00148 | 0.16815 | 0.00115 | 0.00082 | 0.00069 | 0.00202 |
| 1985 | 0.00147 | 0.16034 | 0.00131 | 0.00076 | 0.00065 | 0.00198 |
| 1986 | 0.00135 | 0.10305 | 0.00115 | 0.00069 | 0.00051 | 0.00134 |
| 1987 | 0.00111 | 0.07538 | 0.00087 | 0.00056 | 0.00037 | 0.00094 |
| 1988 | 0.00110 | 0.06985 | 0.00076 | 0.00057 | 0.00034 | 0.00096 |
| 1989 | 0.00106 | 0.07456 | 0.00071 | 0.00055 | 0.00035 | 0.00101 |
| 1990 | 0.00098 | 0.07857 | 0.00069 | 0.00054 | 0.00030 | 0.00088 |
| 1991 | 0.00094 | 0.07315 | 0.00070 | 0.00054 | 0.00030 | 0.00090 |
| 1992 | 0.00089 | 0.06987 | 0.00076 | 0.00054 | 0.00030 | 0.00083 |
| 1993 | 0.00095 | 0.06630 | 0.00088 | 0.00058 | 0.00038 | 0.00092 |
| 1994 | 0.00092 | 0.06413 | 0.00085 | 0.00059 | 0.00038 | 0.00093 |
| 1995 | 0.00088 | 0.06185 | 0.00084 | 0.00060 | 0.00038 | 0.00085 |
| 1996 | 0.00088 | 0.07308 | 0.00079 | 0.00060 | 0.00038 | 0.00090 |
| 1997 | 0.00082 | 0.07184 | 0.00075 | 0.00053 | 0.00031 | 0.00091 |

Table B-7

Exchange Rate Adjusted-Relative Prices (in National Currency): CPI in Malaysia Relative to CPI in Origin Country

| Year | Singapore | Japan | Australia | USA | UK | Germany |
|---|---|---|---|---|---|---|
| 1980 | 0.8963 | 93.0523 | 0.6417 | 0.5307 | 0.2716 | 0.7885 |
| 1981 | 0.8470 | 89.4545 | 0.6006 | 0.4989 | 0.2887 | 0.9546 |
| 1982 | 0.8623 | 102.5334 | 0.6370 | 0.4902 | 0.3213 | 1.0174 |
| 1983 | 0.8773 | 97.5092 | 0.6797 | 0.4958 | 0.3695 | 1.0802 |
| 1984 | 0.8887 | 100.7957 | 0.6913 | 0.4895 | 0.4119 | 1.2117 |
| 1985 | 0.8644 | 94.0143 | 0.7699 | 0.4472 | 0.3790 | 1.1603 |
| 1986 | 0.8408 | 63.9643 | 0.7146 | 0.4257 | 0.3138 | 0.8304 |
| 1987 | 0.8305 | 56.3090 | 0.6475 | 0.4215 | 0.2769 | 0.7042 |
| 1988 | 0.7717 | 48.8831 | 0.5324 | 0.4000 | 0.2399 | 0.6713 |
| 1989 | 0.7252 | 51.1403 | 0.4868 | 0.3789 | 0.2402 | 0.6940 |
| 1990 | 0.6701 | 53.5288 | 0.4732 | 0.3697 | 0.2071 | 0.5973 |
| 1991 | 0.6343 | 49.5053 | 0.4721 | 0.3643 | 0.2026 | 0.6081 |
| 1992 | 0.6606 | 51.7042 | 0.5600 | 0.3995 | 0.2213 | 0.6153 |
| 1993 | 0.6567 | 45.9604 | 0.6094 | 0.3998 | 0.2626 | 0.6395 |
| 1994 | 0.6128 | 42.6932 | 0.5656 | 0.3945 | 0.2555 | 0.6216 |
| 1995 | 0.6163 | 43.3846 | 0.5880 | 0.4233 | 0.2645 | 0.5944 |
| 1996 | 0.6238 | 51.6263 | 0.5597 | 0.4240 | 0.2690 | 0.6343 |
| 1997 | 0.5912 | 51.8463 | 0.5393 | 0.3801 | 0.2256 | 0.6590 |

Table B-8

Real Exchange Rates: Currency of Indonesia Per Unit of Currency of Origin Country

| Year | Singapore | Japan | Australia | USA | UK | Germany |
|---|---|---|---|---|---|---|
| 1980 | 533.62 | 5.14 | 745.37 | 901.22 | 1760.94 | 606.61 |
| 1981 | 525.31 | 4.97 | 740.86 | 891.95 | 1541.11 | 466.12 |
| 1982 | 515.49 | 4.34 | 697.88 | 906.82 | 1383.32 | 436.91 |
| 1983 | 649.40 | 5.84 | 838.24 | 1149.07 | 1541.83 | 527.40 |
| 1984 | 674.48 | 5.95 | 867.15 | 1224.61 | 1455.31 | 494.72 |
| 1985 | 678.33 | 6.24 | 761.58 | 1311.08 | 1546.92 | 505.33 |
| 1986 | 738.31 | 9.70 | 868.66 | 1458.13 | 1978.46 | 747.52 |
| 1987 | 899.50 | 13.27 | 1153.57 | 1772.13 | 2697.36 | 1060.73 |
| 1988 | 906.82 | 14.32 | 1314.35 | 1749.49 | 2916.81 | 1042.41 |
| 1989 | 945.75 | 13.41 | 1408.85 | 1810.16 | 2855.52 | 988.21 |
| 1990 | 1016.72 | 12.73 | 1439.78 | 1842.80 | 3288.85 | 1140.56 |
| 1991 | 1066.99 | 13.67 | 1433.37 | 1857.60 | 3340.46 | 1112.93 |
| 1992 | 1120.12 | 14.31 | 1321.39 | 1852.26 | 3343.25 | 1202.62 |
| 1993 | 1055.59 | 15.08 | 1137.48 | 1734.00 | 2639.98 | 1084.09 |
| 1994 | 1086.35 | 15.59 | 1177.08 | 1687.57 | 2605.19 | 1071.09 |
| 1995 | 1138.18 | 16.17 | 1193.06 | 1657.31 | 2651.97 | 1180.26 |
| 1996 | 1132.42 | 13.68 | 1262.02 | 1666.13 | 2625.85 | 1113.67 |
| 1997 | 1220.63 | 13.92 | 1338.25 | 1898.91 | 3199.05 | 1095.04 |

Table B-9

Real Exchange Rates: Currency of Malaysia Per Unit of Currency of Origin Country

| Year | Singapore | Japan | Australia | USA | UK | Germany |
|---|---|---|---|---|---|---|
| 1980 | 1.1157 | 0.0107 | 1.5585 | 1.8843 | 3.6817 | 1.2683 |
| 1981 | 1.1806 | 0.0112 | 1.6650 | 2.0046 | 3.4635 | 1.0475 |
| 1982 | 1.1597 | 0.0098 | 1.5700 | 2.0400 | 3.1120 | 0.9829 |
| 1983 | 1.1399 | 0.0103 | 1.4713 | 2.0169 | 2.7063 | 0.9257 |
| 1984 | 1.1252 | 0.0099 | 1.4466 | 2.0429 | 2.4278 | 0.8253 |
| 1985 | 1.1569 | 0.0106 | 1.2989 | 2.2361 | 2.6383 | 0.8618 |
| 1986 | 1.1894 | 0.0156 | 1.3994 | 2.3490 | 3.1873 | 1.2042 |
| 1987 | 1.2042 | 0.0178 | 1.5443 | 2.3724 | 3.6110 | 1.4200 |
| 1988 | 1.2958 | 0.0205 | 1.8782 | 2.5000 | 4.1681 | 1.4896 |
| 1989 | 1.3789 | 0.0196 | 2.0542 | 2.6393 | 4.1634 | 1.4409 |
| 1990 | 1.4924 | 0.0187 | 2.1133 | 2.7049 | 4.8274 | 1.6741 |
| 1991 | 1.5766 | 0.0202 | 2.1180 | 2.7448 | 4.9359 | 1.6445 |
| 1992 | 1.5137 | 0.0193 | 1.7857 | 2.5031 | 4.5180 | 1.6252 |
| 1993 | 1.5227 | 0.0218 | 1.6408 | 2.5013 | 3.8082 | 1.5638 |
| 1994 | 1.6318 | 0.0234 | 1.7681 | 2.5349 | 3.9132 | 1.6089 |
| 1995 | 1.6225 | 0.0230 | 1.7008 | 2.3626 | 3.7805 | 1.6825 |
| 1996 | 1.6031 | 0.0194 | 1.7866 | 2.3587 | 3.7173 | 1.5766 |
| 1997 | 1.6914 | 0.0193 | 1.8543 | 2.6312 | 4.4328 | 1.5173 |

Table B-10

Per Capita GDP in Constant 1990 US Dollar

| Year | Singapore | Japan | Australia | USA | UK | Germany |
|---|---|---|---|---|---|---|
| 1980 | 7688 | 16995 | 14463 | 19526 | 13418 | 19561 |
| 1981 | 8323 | 17476 | 14770 | 19682 | 13240 | 19550 |
| 1982 | 8786 | 17904 | 14432 | 19073 | 13478 | 19366 |
| 1983 | 9742 | 18260 | 14378 | 19635 | 13964 | 19773 |
| 1984 | 10422 | 18917 | 15292 | 20668 | 14248 | 20415 |
| 1985 | 10088 | 19735 | 15730 | 21133 | 14739 | 20935 |
| 1986 | 10156 | 20145 | 15849 | 21551 | 15324 | 21407 |
| 1987 | 11013 | 20869 | 16297 | 22016 | 16017 | 21673 |
| 1988 | 11000 | 22076 | 16645 | 22675 | 16774 | 22331 |
| 1989 | 11729 | 23021 | 17060 | 23035 | 17080 | 22937 |
| 1990 | 12401 | 24053 | 17011 | 22983 | 17089 | 23780 |
| 1991 | 13001 | 24878 | 16574 | 22516 | 16681 | 21286 |
| 1992 | 13428 | 25054 | 16813 | 22878 | 16535 | 21594 |
| 1993 | 14465 | 25059 | 17295 | 23140 | 16827 | 21181 |
| 1994 | 15493 | 25162 | 18043 | 23728 | 17493 | 21728 |
| 1995 | 16321 | 25483 | 18551 | 23983 | 17903 | 22084 |
| 1996 | 16779 | 26365 | 19009 | 24422 | 18243 | 22312 |
| 1997 | 17419 | 26536 | 19332 | 25117 | 19047 | 22718 |

Table B-11

Exchange Rate Adjusted-Relative Prices (in US Dollar): CPI in Indonesia Relative to CPI in Origin Country

| Year | Singapore | Japan | Australia | USA | UK | Germany |
|---|---|---|---|---|---|---|
| 1980 | 0.00103 | 0.00134 | 0.00105 | 0.00111 | 0.00101 | 0.00102 |
| 1981 | 0.00105 | 0.00139 | 0.00105 | 0.00112 | 0.00116 | 0.00133 |
| 1982 | 0.00107 | 0.00159 | 0.00112 | 0.00110 | 0.00129 | 0.00142 |
| 1983 | 0.00085 | 0.00118 | 0.00093 | 0.00087 | 0.00116 | 0.00117 |
| 1984 | 0.00082 | 0.00116 | 0.00090 | 0.00082 | 0.00123 | 0.00125 |
| 1985 | 0.00081 | 0.00111 | 0.00103 | 0.00076 | 0.00115 | 0.00122 |
| 1986 | 0.00075 | 0.00071 | 0.00090 | 0.00069 | 0.00090 | 0.00083 |
| 1987 | 0.00061 | 0.00052 | 0.00068 | 0.00056 | 0.00066 | 0.00058 |
| 1988 | 0.00061 | 0.00048 | 0.00059 | 0.00057 | 0.00061 | 0.00059 |
| 1989 | 0.00058 | 0.00051 | 0.00055 | 0.00055 | 0.00063 | 0.00063 |
| 1990 | 0.00054 | 0.00054 | 0.00054 | 0.00054 | 0.00054 | 0.00054 |
| 1991 | 0.00052 | 0.00051 | 0.00055 | 0.00054 | 0.00053 | 0.00056 |
| 1992 | 0.00049 | 0.00048 | 0.00059 | 0.00054 | 0.00053 | 0.00051 |
| 1993 | 0.00052 | 0.00046 | 0.00069 | 0.00058 | 0.00068 | 0.00057 |
| 1994 | 0.00051 | 0.00044 | 0.00066 | 0.00059 | 0.00069 | 0.00058 |
| 1995 | 0.00048 | 0.00043 | 0.00065 | 0.00060 | 0.00067 | 0.00052 |
| 1996 | 0.00049 | 0.00050 | 0.00062 | 0.00060 | 0.00068 | 0.00056 |
| 1997 | 0.00045 | 0.00050 | 0.00058 | 0.00053 | 0.00056 | 0.00057 |

Table B-12

Exchange Rate Adjusted-Relative Prices (in US dollars): CPI in Malaysia relative to CPI in Origin Country

| Year | Singapore | Japan | Australia | USA | UK | Germany |
|---|---|---|---|---|---|---|
| 1980 | 0.4945 | 0.6427 | 0.5014 | 0.5307 | 0.4848 | 0.4880 |
| 1981 | 0.4673 | 0.6178 | 0.4693 | 0.4989 | 0.5153 | 0.5908 |
| 1982 | 0.4758 | 0.7082 | 0.4977 | 0.4902 | 0.5735 | 0.6297 |
| 1983 | 0.4840 | 0.6735 | 0.5310 | 0.4958 | 0.6595 | 0.6686 |
| 1984 | 0.4903 | 0.6962 | 0.5401 | 0.4895 | 0.7351 | 0.7499 |
| 1985 | 0.4769 | 0.6493 | 0.6015 | 0.4472 | 0.6765 | 0.7181 |
| 1986 | 0.4639 | 0.4418 | 0.5583 | 0.4257 | 0.5600 | 0.5140 |
| 1987 | 0.4582 | 0.3889 | 0.5059 | 0.4215 | 0.4943 | 0.4359 |
| 1988 | 0.4258 | 0.3376 | 0.4160 | 0.4000 | 0.4282 | 0.4155 |
| 1989 | 0.4001 | 0.3532 | 0.3804 | 0.3789 | 0.4287 | 0.4296 |
| 1990 | 0.3697 | 0.3697 | 0.3697 | 0.3697 | 0.3697 | 0.3697 |
| 1991 | 0.3499 | 0.3419 | 0.3689 | 0.3643 | 0.3616 | 0.3764 |
| 1992 | 0.3645 | 0.3571 | 0.4375 | 0.3995 | 0.3950 | 0.3808 |
| 1993 | 0.3623 | 0.3174 | 0.4762 | 0.3998 | 0.4687 | 0.3958 |
| 1994 | 0.3381 | 0.2949 | 0.4419 | 0.3945 | 0.4561 | 0.3847 |
| 1995 | 0.3400 | 0.2996 | 0.4594 | 0.4233 | 0.4721 | 0.3679 |
| 1996 | 0.3442 | 0.3566 | 0.4373 | 0.4240 | 0.4801 | 0.3926 |
| 1997 | 0.3262 | 0.3581 | 0.4213 | 0.3801 | 0.4026 | 0.4079 |