

# An econometric study of tourist arrivals in Aruba and its implications

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## Abstract

The principal purpose of this study is to analyze econometric estimates in order to explain tourist arrivals to Aruba from the United States, The Netherlands and Venezuela. The study specified a dynamic econometric model for modeling short term as well as the long-term responses. It estimated both linear and log-linear functions, and it applied the Box–Cox statistical method to determine the appropriate functional form. The inclusion of Venezuela as a developing country permitted the comparison of the behavior of tourism demand in relatively rich and poor countries. The results indicated the extent to which cross-country behavior of demand differs with respect to changes in effective prices and exchange rates. This study can assist in the formulation of future macroeconomic policies as well as market and pricing strategies in a small or microstate economy.

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## 1. Introduction

The Caribbean has been engaged in tourism for nearly 100 years (Schwartz, 1999), and tourism's contribution to the economies of Caribbean countries is clear and convincing. Nowhere has tourism growth been more robust than among the islands in the Caribbean. The region has been identified as the most tourism-dependent region in the world (Bryan, 2001).

There are several studies on international tourist flows to Caribbean countries (Archer, 1976; Clarke, 1978; Summary, 1983; Archer, 1984; Rosensweig, 1988; Metzgen-Quemarez, 1989; Carey, 1991; Dharmaratne, 1995; Yoon & Shafer, 1996; Dalrymple & Greenidge, 1999; Greenidge, 2000; Vanegas & Croes, 2000; Croes, 2000). This is a relatively small number, however, given the importance of tourism to the Caribbean. What is clear from the studies that do exist is that income in the tourist-generating country can explain the variation in

demand for tourism products in the region, while the role of price is inconclusive.

The objective of this study is to examine determinants and functional forms of international tourism demand to Aruba from its main markets: the United States, Venezuela and The Netherlands. These origin countries accounted for approximately 82.5% of total world tourism arrivals in 2000 (Table 1). Furthermore, the United States and The Netherlands represent two of the world's major tourist regions (i.e., North America and Europe together cover 70% of the distribution of global tourism), while Venezuela represents a typical developing country from the South engaged in generating tourists to the South.

This article has expanded significantly upon previous studies of Vanegas and Croes (2000), and Croes (2000). It contributed to the literature with an application of dynamic econometric modeling of international tourism demand. Furthermore, it examined two distinct regions in the global spatial distribution of tourism: (1) the North by analyzing the United States and The Netherlands, and (2) the South by analyzing Venezuela. By including the latter region, the study fills an important

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Table 1  
Trends in tourist arrivals by country of origin (1975–2000) (in thousands)

Year	United States	Venezuela	The Netherlands	Rest of the World	Total tourist arrivals
1975	75.0	24.8	2.7	26.4	128.9
1976	94.7	30.4	2.7	17.7	145.5
1977	95.6	35.2	3.0	17.4	151.2
1978	104.9	38.2	3.3	17.5	163.9
1979	118.5	40.8	4.0	21.8	185.1
1980	110.8	54.0	4.4	19.7	188.9
1981	124.0	66.3	5.6	25.5	221.4
1982	114.3	74.4	4.9	26.6	220.2
1983	131.6	28.5	5.0	30.1	195.2
1984	148.5	21.4	6.1	34.2	210.2
1985	152.1	21.6	5.0	28.0	206.7
1986	132.4	14.4	6.2	28.2	181.2
1987	161.1	16.5	9.4	44.6	231.3
1988	187.9	19.7	15.1	55.3	278.0
1989	210.5	32.3	25.3	76.2	344.3
1990	245.9	50.4	28.0	108.5	432.8
1991	263.4	74.7	35.3	127.9	501.3
1992	286.5	90.3	34.2	130.7	541.7
1993	315.3	84.7	32.5	129.5	562.0
1994	324.3	75.2	32.2	150.4	582.1
1995	344.9	85.6	33.3	151.6	615.4
1996	371.5	74.8	36.2	158.3	640.8
1997	364.9	88.4	33.3	163.3	649.9
1998	372.5	99.1	31.0	144.8	647.4
1999	416.9	103.6	32.0	130.8	683.3
2000	452.2	112.0	30.6	126.4	721.2

Source: Aruba Tourism Authority Statistics.

vacuum in the literature by focusing the analysis on the export level between two developing countries.

The study specified dynamic econometric models for modeling short-term impacts as well as long-term dynamics. The observed significance of the lagged dependent variable in such models indicates empirically that a dynamic structure is likely to be a necessary part of the model specifications (Fujii & Mak, 1981; Witt & Martin, 1987; Sinclair & Stabler, 1997). The inclusion of the lagged dependent variable as an explanatory variable, in part, considers the structural questions that modeling evokes.

The first section will examine the theoretical framework of tourism demand, describe tourism developments in Aruba and set forth the specification of the demand model for international tourism to Aruba. The second section will review the econometric methodology and the estimation results. The third section will consider the policy implications of the estimates elasticity's for tourism policy formulation. The final section will summarize the findings of the study.

## 2. Literature review and demand model

Empirical studies can help to explain the level and pattern of tourism demand. They can also discern its

responsiveness to the variables on which it depends, such as income in the tourist-generating country and the relative inflation and exchange rates between the origin and destination countries. Most studies that have attempted to model tourism demand have used the single equations model as noted recently by Lim (1997), Sinclair and Stabler (1997), Morley (1997), Song and Witt (2000), and Divisekera (2003).

Tourism demand is viewed as the amount of tourist goods that a customer is willing and able to buy at a certain time and under certain conditions. In this case, demand is a function of a set of variables. The theoretical issue is the identification of this set of variables in the demand equation and the selection of the functional form (e.g., linear or log-linear) appropriate for the estimation of the parameters in the equation. This is expressed in mathematical form as follows:

$$D = f(x_1, x_2, \dots, x_n),$$

where  $D$  may be viewed as a tourism demand function, it is expressed as a function of  $x_n$ : price, income and other variables. According to Sinclair and Stabler (1997), the advantages of the use of single equations model are three-fold: (1) it provides useful information through the estimation of elasticities (which could be useful information regarding the marginal utility and total revenues of a destination); (2) the elasticity value can be calculated

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