

# **A Review of Micro Analyses of Tourist Expenditure**

## **Abstract**

Tourist expenditure is an important measure of international tourism demand. This study is a review of expenditure analyses in a tourism context presenting a range of factors that could affect tourism demand and expenditure. A review of 27 tourism expenditure studies that used micro data was conducted, to elicit the sample size, model specification, as well as the dependent and independent variables. The study concluded that greater emphasis should be given to micro-economic modelling of tourism demand and to the investigation of the effect of psychological and destination-related factors on tourist expenditure.

Keywords: review, tourist expenditure, micro-economic analyses

## **Introduction**

Most existing studies used the numbers of tourist arrivals as the measurement of international tourism demand (Lim, 1999; Song & Witt, 2000). However, the tourism product is not just one commodity, but a bundle of goods and services purchased by tourists. The purchasing behaviour of tourists is also likely to vary because tourists differ in terms of their demographics, length of stay, types of accommodation used, purpose of visit, and many other aspects. These variations lead to differences in expenditure among tourists. Consequently, the use of tourist arrivals, which does not reflect tourist consumption patterns and expenditures, can not precisely measure tourism economic impact on the destination.

As economic impacts are expenditure driven, theoretically, it would be useful if tourism expenditures were used more frequently in tourism demand studies. As Cai (1999, p. 16) remarked, “market demand, when expressed in dollar amount, should be a preferred measurement of its substantiality”. Wang, Rompf, Severt, and Peerapatdit (2006, p. 333) also pointed out that tourism expenditure is “typically scrutinised by policy makers, planning officials, marketers and researchers for monitoring and assessing the impact of tourism on the local economy”.

There have been several reviews of tourism demand studies (Crouch, 1994; Lim, 1997, 2006; Li, Song, & Witt, 2005; Song & Li, 2008); these studies focus on demand analyses in general rather than at the micro level. This paper reviews studies on micro-economic modelling of tourist expenditure. The purpose of the study is to provide a reference for researchers in relation to the sample size, model specification and variables used. A typology of international tourism demand studies is presented

where micro-economic analysis of tourist expenditure is an important component. This is followed by a review of studies that focus on modelling tourist expenditure at the micro level. A conclusion is drawn and a number of directions for future research are indicated.

## **Types of International Tourism Demand Study**

Numerous empirical studies on international tourism demand have been undertaken to explain the possible factors that influence tourist flows worldwide. This study classifies existing demand studies into categories shown in Figure 1.

Insert Figure 1 here

The demand for tourism can be examined at a macro- or micro-economic level. Tourism demand studies at the macro-economic level are usually concerned with the analysis of aggregated demand. Based on the types of data used, such studies can be classified as time series, cross-sectional and pooled analyses. Time series data refer to data collected over time. Such data enables the modelling of trends, seasonalities and cycles (Hanke, Wichern, & Reitsch, 2001). In many cases, aggregated time series data on inbound and outbound tourists are used to analyse the demand for travel by one or more origin countries for a tourism destination. However, a relatively small sample size is a major problem in time series analysis due to the unavailability of data over a long period (Crouch, 1994; Lim 1997).

Observations collected at a single point in time across a number of units are called cross-sectional data that are often used to compare tourism demand across countries at one point in time instead of over time periods. The analysis of cross-sectional data

may take the form of single equation or system of equations. Despite being closer to consumer behaviour theories, the latter is less common in a tourism context (Li, Wong, Song, & Witt, 2006b). A recent development in tourism literature is the introduction of various specifications of the Almost Ideal Demand System (AIDS) (i.e. Li, Song, & Witt, 2006a; Mangion, Durbarry, & Sinclair, 2005). Time series data on a cross-section of economic units are called pooled data (Hill, Griffith, & Judge, 2001). Pooled data contain cross-sectional information reflecting the differences in tourism demand between countries and time series information reflecting the changes within a country over time. The use of pooled data also increases the number of observations and hence the degree of freedom, which helps to address concerns related to unreliable estimates generated due to the use of small sample sizes. Few empirical studies in the tourism literature have utilised pooled data to analyse international tourism demand (Crouch, 1994; Lim, 1997 & 2006).

Comprehensive reviews of tourism demand analyses by Crouch (1994), Lim (1997 & 2006); Li et al. (2005), Song and Li (2008) have shown much advancement in research at the macro level with the application of new models such as AIDS and Time Varying Parameter (TVP). This study is not meant to replicate previous research effort; rather it differentiates itself by focusing on micro-economic studies.

Crouch (1994) argued that, “the majority of studies have been macro-economic in nature, .... Micro-economic studies of individual or household tourism behaviour are rare” (p. 41). As indicated by the name, micro-economic studies use micro data, which are collected on individual economic decision-making units (Hill et al., 2001). In micro-economic studies of tourism, individuals, households or firms are often the

unit of analysis. Most studies at the micro-economic level can be classified into three groups. Studies in the first group are concerned with optimal choice in tourism demand. In these studies, the choices of tourists are put in a discrete choice framework and the influences of different aspects of tourist decision-making processes on the choice are taken into consideration. The second group of studies examines the important factors that affect individual tourist expenditures on a given trip and this group is of particular interest to this paper. The third group comprises a small number of studies aimed at modelling tourism prices, for instance using hedonic pricing method.

### **A Review of Micro-economic Analyses of Tourist Expenditure**

Understanding tourist expenditure is critically important because “tourism is an expenditure-driven economic activity” and “the consumption of tourism is at the centre of the economic measurement of tourism and the foundation of the economic impacts of tourism” (Mihalic, 2002, p. 88).

Analysis of tourism demand has been predominantly at the macro-economic level that uses aggregated data such as total arrivals and expenditure in a tourist destination by a market (Crouch, 1994; Lim, 2006; Rosselló-Nadal, Riera-Font, & Capó-Parrilla, 2006). This relates to a high degree of variance in cross-sectional data, which makes modelling an individual’s demand for a product more complex and less accurate than modelling the demand for a group of people. Aggregation tends to average out individual idiosyncrasies and consequently, as the level of aggregation increases, both the reliability and accuracy of the model improve. This said, studies using highly aggregated data are less valuable to tourism planning and policy making than those based on data of a lower level of aggregation (Smith, 1995). Deaton and Muellbauer

(1980) commented that existing studies often “treated aggregated data as if they had related to a single consumer. There is...no general reason to suppose that this is valid. Even so, it often appears as though models that ignore aggregation phenomena fit as well as those that explicitly allow for them” (p. 80). Lim’s (2006) survey of tourism demand analyses showed that out of the 124 studies reviewed, only 8 used survey data at a micro level. This finding supports the view that there is a need for more micro-econometric studies in this area.

Although macro and micro economic studies serve different purposes, micro-econometric models have three advantages over macro-econometric models (Alegre and Pou, 2004). Firstly, the models do not deviate too far from theoretical economic consumer models. Secondly, they allow for the control of participation bias, which is introduced when the analysis is based on aggregated data. Thirdly, they acknowledge the diversity and heterogeneity of consumer behaviours that are ignored in studies using highly aggregated data.

This review of micro-economic tourism demand studies has identified 27 that used expenditure as the measurement of an individual’s demand for tourism. The following sections present these studies in terms of sample size, modelling method, as well as the dependent and independent variables used.

### ***Sample sizes and modelling methods***

Apart from the earliest study undertaken in 1977 (Mak, Moncur, & Yonamine, 1977) researchers have only shown a renewed interest in the subject since the 1990s. This interest has grown rapidly since the turn of the century with 21 out of the 27 studies being conducted in or after 2000 (see Table 1).

Insert Table 1 here

Table 2 provides the frequency distribution of the sample sizes used in the 27 studies. A dramatic variance in sample sizes is noted, with the smallest sample of 162 observations compared to the largest sample of more than 5000 observations, although most studies have less than 1500 observations. The sample sizes reported sometimes refer to the total number of questionnaires received rather than the number of cases used in modelling. All studies used survey data collected either by the research team in the specific research context or by tourism and other authorities for other purposes (e.g. annual visitor survey).

Insert Table 2 here

As shown in Table 3, the most common model specification used in these studies is multiple regression models (17 out of the 27 studies). The advantage of multiple regression analysis is that it allows for the investigation of collective and separate effects of two or more independent variables on visitors expenditure. General linear models such as logistic regression and MANOVA are used in four studies. Two studies (Mak et al, 1977; Nicolau & Más, 2005) used systems of equations in order to simultaneously model tourist expenditure and other tourist decisions such as decision to take a holiday and length of stay. The remaining studies used Tobit regression (Lee, 2001; Leones, Colby, & Crandall, 1998), structural equation modelling (Seiler, Hsieh, Seiler, & Hsieh, 2002) and path analysis (Jang, Cai, Morrison, & O'Leary, 2005). The



numbers of studies that used log-linear and semi-log functional forms are six and five, respectively, with no data transformation used in the other 16 studies.

Insert Table 3 here

These studies, with the exception of Henthorne (2000), which studied Cruise ship passengers expenditure in Jamaica, focused almost exclusively on the developed destinations, to be precise, the United States (U.S.), the United Kingdom (U.K.), Canada, Spain, Norway, Finland, Australia, and Singapore. Similarly, travellers under study are predominantly Americans and Europeans, with only seven analyses (Dávila, Asgary, de los Santos, & Vincent, 1999; Jang, Bai, Hong, & O'Leary, 2004; Laesser & Crouch, 2006; Lehto, Cai, O'Leary, & Huan, 2004; Lehto, Morrison, & O'Leary, 2001; Seiler et al., 2002; Wang & Davidson, in press) examining travellers from other countries. Among these studies, Seiler et al. (2002) and Lehto et al. (2004) looked into the expenditure of Taiwanese travellers to the U.S. and Singapore, whereas Laesser and Crouch (2006) and Lehto et al. (2001) examined the expenditures of a number of destinations major inbound markets. The other three studies focused on Japanese, Mexican and Chinese travellers.

Another important observation is that independent variables used in existing studies were not able to sufficiently explain the level of expenditure. Most studies reported  $R^2$  or Adjusted  $R^2$  value, which is sometimes below 0.2, meaning the independent variables included in the analyses accounted for no more than 20% of the variance in expenditures. In Jang et al. (2004), Cannon and Ford (2002), Asgary et al. (1997), the explanatory power of the expenditure model was lower than 0.1.

### ***Dependent Variables***

Dependent variables used in the 27 studies are presented in Figure 2. They include expenditure per person per day, total travel expenditure, total party expenditure, party expenditure per day, pre-paid expenditure in the origin country, and expenditure in the destination, etc.

Insert Figure 2 here

Five studies (Agarwal & Yochum, 1999, 2000; Aguilo Perez & Juaneda Sampol, 2000; Lee, 2001; Lehto et al., 2001; Mak et al., 1977; Wang et al., 2006) used more than one dependent variable as measures of tourist spending. Among these studies, Aguilo Perez and Juaneda Sampol (2000) separated expenditures incurred in the origin country from those at the destination in order to facilitate the study of tourism demand for some mass tourism destinations, such as the Spanish Balearic Islands that attract more package tourists than non-package tourists. Lee (2001), Lehto et al. (2001) and Wang et al. (2006) examined determinants of disaggregated tourist expenditures on things such as lodging, meals, attractions, entertainment, shopping, and transportation. The breakdown of expenditure enables researchers to investigate whether a particular factor influences different spending categories to different degrees. Thus, the result of the study provides information with more meaningful implications to individual sectors in the tourism and services industries.

### ***Independent Variables***

Theoretically, the demand for tourism is influenced not only by economic and social factors, but also by psychological factors (Ryan, 2003). Besides these three groups of variables, this current review highlighted that trip-related and destination-related variables have also been included as independent variables in empirical modelling of tourist expenditure.

### **Economic variables**

The economic and social-demographic variables used in these studies are summarised in Table 4. Income and price are the two most important economic determinants of leisure tourism demand. Economic theory suggests that when an individual's income increases, his/her demand for travel is also likely to increase. In general, tourism demand is income elastic although business, luxury, and VFR travel demand are relatively less income-elastic than leisure tourism demand (Bull, 1995). All the studies in this review except five included income as an independent variable and the proxy variables used for income include household income, gross annual income, total income of the visiting party, disposable income, total household expenditures, and wage rate, etc. For the purpose of modelling, it is preferable that income is measured as a continuous variable instead of a categorical variable. However, many travellers were reluctant to give away their exact income. This reduced the response rate and led to a smaller usable sample (Downward & Lumsdon, 2003). For this reason, income was often collected as a categorical variable.

Insert Table 4 here

The estimated income variable was found to be significant, except in Downward and Lumsdon (2000), Leones et al. (1998), and Lehto et al. (2004). The first two studies focused on the demand for day-visits and domestic nature tourists and the third (Lehto et al., 2004) looked at shopping expenditures by Taiwanese to Hong Kong and Singapore: two destinations enjoying a reputation of value for money shopping. Five studies used both income variable and log-linear functional form, in which the income elasticity is given directly by the coefficient of income variable. These studies were conducted in the context of domestic and cross boarder tourism; they suggest an income inelastic expenditure with the elasticity ranging from 0.095 to 0.332. This indicates that some forms of tourism including day-visit, domestic travel and short haul international travel may have become normal rather than being perceived as luxury goods by travellers from developed countries. For the more costly long haul international travel income is likely to have a more significant impact on demand.

Price is another important determinant of tourism expenditure and with all other effects on demand unchanged, the demand increases when the price decreases (Tribe, 2005). In cross-sectional demand studies, it is often assumed that all individuals being studied face identical prices. By doing this, the difference in behaviours can be explained by the difference in individual characteristics (Deaton & Muellbauer, 1980, p. 18), even though four studies attempted to examine the impact of price on expenditure. Asgary, De Los Santos, Vincent, and Davila (1997) incorporated relative price in the expenditure function as a categorical variable. In their study, 59% of the Mexican visitors purchased products in the Lower Rio Grande Valley region of Texas because the products there were perceived to be cheaper than those in Mexico. Aguilo Perez and Juaneda Sampol (2000) examined the effect of traveller perception about

price in the destination on their expenditure. An interesting finding is that tourists who perceived the destination to be expensive tend to spend more money than those who did not. Agarwal and Yochum (2000) used two qualitative variables, lodging reservations and weekend accommodation, to capture the effect of differences in accommodation prices. The authors concluded that both variables had a significant impact on the per person per day expenditure. Mak et al. (1977) interpreted the airfare and staying in a hotel (dummy variable) as the proxies for prices. Their research suggests that the higher the airfare, the more visitors spent on a per capita per day basis. Staying in a hotel shortened length of stay but led to an increase in their expenditure.

### **Social-demographic Variables**

Although economic factors are critical as they enable people to travel, they cannot fully explain tourist expenditure. Asgary et al. (1997) found that, by adding social and demographic variables to the model along with economic variables, the explanatory power of the model increased substantially, suggesting the need to incorporate such variables into the expenditure function. In practice, incorporating the right mix of variables is difficult or even prohibitive due to data deficiency. At the macro level, this deficiency has been tackled through market segmentation and recently TVP was introduced to capture any social and institutional trends in the data series.

The review showed that the expenditure is affected by a complex set of social demographic characteristics of travellers, for instance gender, age, marital status, education level, occupation, place of residence, nationality, ethnic background, size and composition of the household (see Table 4). As people often travel in groups, the social-demographic characters of the head of the travel party are sometimes used such

as in Agarwal and Yochum (1999 & 2000) where the age and gender of the head of the household or travel party are reported.

The empirical findings of the effect of social demographic variables on tourism expenditure are often in conflict. Leones et al. (1998), Agarwal and Yochum (1999), Chhabra, Sills, and Rea (2002), and Lee (2001) found that age did not affect the expenditure (See Table 5). There is another group of studies (Downward & Lumsdon, 2000; Jang et al., 2004; Mak et al., 1997; Wang et al., 2006) claiming a significant impact of age on travel expenditure. Jang et al. (2004), Henthorne (2000), and Thrane (2002) found that older travellers outspent younger travellers, whilst Wang et al. (2006) and Mehmetoglu (2007) suggested a negative relationship between expenditure and the age of travellers. In contrast, the findings of Mak et al. (1977), Nicolau and Más (2005), and Wang and Davidson (in press) imply a non-linear relationship between age and expenditure because middle-aged travellers had a higher expenditure than their younger and older counterparts. Additionally, Downward and Lumsdon (2000) found a joint effect of the number and age of the male and female adults in the travel party on group spending by day visitors.

Insert Table 5 here

Generally, gender is not a significant determinant of spending (Agarwal & Yochum, 2000; Henthorne, 2000; Jang et al., 2004; Wang & Davidson, in press), except in Thrane (2002) where males spent more than females. As shown in Table 6, there is no consensus about the role of marital status in determining expenditure. Travellers who are not married were found to spend more than the married travellers in Mak et al.

(1977), but less in Asgary et al. (1997) and Nicolau and Más (2005). To the contrary, Cannon and Ford (2002), Wang et al. (2006), and Wang and Davidson (in press) found that expenditure and marital status were unrelated.

Insert Table 6 here

It is evident that there are no common empirical findings with respect to the effect of social demographics. The studies reviewed were diverse and covered a wide range of research interests. This range included many tourist activities and recreational pursuits, both national and international. Additionally, there were various nationalities and the unit of analysis varied. To put it simply, social demographics do not add greatly to the overall understanding but are useful to provide contextual background.

### **Trip-related variables**

Trip-related variables are summarised in Table 7. These variables describe the characteristics of visitors' trips such as travel party size, length of stay, and first-time/repeat visitors. Travel party size was found to be negatively related to total expenditure per person (Taylor, Fletcher, & Clabaugh, 1993; Wang & Davidson, in press) but positively related to total expenditure / total expenditure per day (Agarwal & Yochum, 1999; Dávila et al., 1999; Lee, 2001). Agarwal and Yochum (1999) also found that more children in the travel party led to a decrease in total party expenditure because children are not income-earners. However, Wang et al. (2006), Lee (2001), and Nicolau and Más (2005) did not find children's impact significant. Instead, number of adults in the travel party was found to be positively related to total expenditure (Wang et al., 2006). Jang et al. (2004) argued that total spending was

affected not by the number of adults in the group, but rather by whether the traveller had companions or not.

Insert Table 7

Existing studies also revealed a significant influence of length of stay at the destination on traveller expenditure. Length of stay was found to have a positive impact on total tourist expenditure (Agarwal & Yochum, 1999; Downward & Lumsdon, 2004; Nicolau & Más, 2005; Pouta, Neuvonen, & Sievänen, 2006; Thrane, 2002), but a negative impact on daily tourist expenditure (Mehmetoglu, 2007; Taylor et al., 1993). For instance, Downward and Lumsdon (2004) found that every 1% increase in duration of stay led to a 0.31% increase in visitor spending in the context of visitors to a rural national park. Taylor et al. (1993) report that at the 10% significance level, length of stay is negatively associated with expenditure per day by visitors to a regional tourism destination.

Mak et al. (1977) claimed that there is no significant difference in expenditure between first-time and repeat visitors. Wang et al. (2006) and Wang and Davidson (in press) agreed that the factor of first-time/ repeat visitation generally did not impact upon travellers total expenditure nor on disaggregated expenditure. Jang et al. (2004) and Pouta et al. (2006) suggested the opposite by claiming that repeat visitors tend to spend less than first-time visitors. Package tourists are associated with lower expenditure. According to Laesser and Crouch (2006), group tourists had an expenditure that was 10% less than the average of all tourists to Australia, but they outspent independent travellers in shopping (Lehto et al., 2004). The findings on



travel distance and planning are consistent. The longer distance people travelled, the higher their expenditure (Chhabra et al., 2002; Nicolau & Más, 2005; Pouta et al., 2006; Thrane, 2002) and advanced forward planning is also associated with higher expenditure (Chhabra et al., 2002; Thrane, 2002).

Besides the factors mentioned above, a wide range of other trip related variables have also been incorporated in modelling expenditure. Among others, they include means of transport, payment method, accommodation type, number of site visited, type of trip, trip purpose, stopovers in other destination, information acquisition behaviour and reservation type.

### **Destination-related and psychological variables**

As Morley (1990, as cited in Ross, 1994) pointed out, demand is “a function of characteristics and attributes of the tourism destinations, their attractions, prices and the effectiveness of the market of the destination” (p. 6). Laesser and Crouch (2006) also claimed that the demand is “activated either endogenously, or within a person (i.e., pushed by own internal forces or person-related obligations); or exogenously (i.e., pulled by the external forces of the destination attributes, sometimes communicated by means of promotion)” (p. 397, 398). Therefore, it can be assumed that the level of expenditure is determined by both objective elements (i.e., place of origin) and subjective elements such as motivations and perceptions. Modelling tourist expenditure should consider not only tangible and functional factors, but also intangible and emotional factors. In this review, the two types of factors are classified as destination-related and psychological variables.

Psychological variables include traveller evaluation of trip/holiday/vendor, psychological characteristics, trip motives, and taste. Wang et al. (2006) examined the effect of traveller psychological characteristics on their total and disaggregated expenditure. Five psychographic variables presenting what travellers value most were incorporated in their study. Variables included were stability/excitement, self/family, being passive/being active, learning/dropping out and follow tradition/try new things. People seeking excitement had a higher expenditure than those seeking stability and self-oriented people spent more on accommodation than those who were family-oriented. Other studies found that people who travelled for ego / status enhancement tend to spend more than people travelling with other motives (Mehmetoglu, 2007) and the stronger the motive, the higher the expenditure would be (Thrane, 2002).

Downward and Lumsdon (2000 & 2003) measured travellers taste by the importance of the factors attracting them to the destination and the motives for visiting the destination. The authors concluded that individual market attractors did not influence the level of spending at the destination but these attractors jointly encouraged tourists to the destination, and that the motives for visiting did not have an impact on spending.

The quality of tourist product to some extent is reflected in its price and relative price competitiveness explains why one destination is preferred over the others offering a similar tourist experience (Mangion et al., 2005). Researchers therefore have tried to capture product characteristics by price effect. For instance, at the macro level, the AIDS estimate price and cross price elasticity to capture how the relative price competitiveness (as a reflection of destination attributes) affects the demand for a set

of destinations. A limited number of studies (i.e. Papatheodorou, 2002; Mangion et al., 2005) used hedonic pricing models to assess how product characteristics affect price therefore the potential revenue for the organisation. Nonetheless, potential demand may not always transform into actual expenditure and price alone is not representative of product quality. In micro analysis, quality can be measured directly by traveller evaluation of the trip/product. Aguilo Perez and Juaneda Sampol (2000) revealed that traveller opinion of the trip can affect their expenditure. Those who had a 'bad' holiday spent 31.7% less than those who had a 'good' holiday. Chhabra et al. (2002) also found that enjoyment had a positive effect on expenditure. Additionally, vendors who were perceived to be aggressive did not attract as much expenditure as those who were positively perceived by travellers (Henthorne, 2000).

Destination-related factors such as travel activities available at the destination also influence travel expenditures after controlling for income; for example, travel activities that are related to "nature", "beach and outdoor", and "entertainment" can generate more tourism revenue than other activities (Jang et al., 2005). Other studies (Laesser & Crouch, 2006; Mehmetoglu, 2007; Pouta et al., 2006) noted that the level of expenditure was associated with certain tourist activities at the destination. In Australia's case, tourists who desired to experience beaches and local culture had lower expenditure than those interested in Australian food and gambling as well as visiting outback destinations and wineries. As suggested, highly commodified tourism products induce a lower level of expenditure than less commoditised products that require a higher level of personal, logistical and financial effort (Laesser & Crouch, 2006).

This section presented a review of literature on modelling tourist expenditure at the micro level. The review identified several major groups of variables that have been included in the expenditure studies: economic, social demographic, trip-related, destination-related, and psychological variables. Income has been identified as a significant determinant of travel expenditure although expenditure on short haul travel is often income inelastic, which is contrary to the previous suggestion that travel demand is generally income elastic. The empirical results regarding the effect of social demographics and trip-related variables are often in conflict, suggesting a need for further investigation into this area. Few studies have attempted to investigate the impact of psychological and destination-related factors on expenditure and no solid conclusion can be made in this regard due to the small number of studies.

### **Conclusions and recommendations for future research**

Demand for tourism can be analysed at either macro or micro level. At both levels, the demand is affected by a large number of economic, social, political and psychological factors. Compared to studies at the macro level, micro-economic models have the advantage of being “closer to theoretical economic consumer models” and they can also “include the diversity and heterogeneity of consumer behaviour that is cancelled out when aggregate information is used” (Alegre & Pou, 2004. pp. 125-126). This paper reviewed 27 studies on modelling tourist expenditure, which has led to the following conclusions and recommendations for future research.

Firstly, existing analyses on international travel demand were conducted primarily at the macro level, which uses aggregated tourist arrival and expenditure data. However, even within a particular market segment, people differ from each other in their consumption behaviour, and discerning different spending patterns among travellers is

important. Thus, future studies should aim at explaining traveller spending behaviour at the micro level. Future studies may also utilise modelling techniques other than multiple regression that was adopted by most studies reviewed.

Secondly, a review of studies on modelling tourist expenditure at the micro level was presented, providing information on the sample sizes, model specifications, and variables used. The review indicated that income, social demographic, and trip-related characteristics are commonly used variables in explaining individual demand for tourism products.

Thirdly, theoretically, psychological and destination-related factors may also affect the level of expenditure. Despite this, there has been limited effort to investigate the role of these variables, presenting a potential area of interest for future research. As pointed out by Wang et al. (2006, p. 345), “attitudes and perceptions toward destinations and their impacts on spending patterns should also be examined in future studies”. Therefore, how destination attributes interact with psychological factors such as expectations and perceptions to influence travellers expenditure level appears to be an interesting topic for research. Although tourism economists have been confronted with the difficulty of measuring psychological and destination-related variables, research development in tourist psychology and destination management/marketing, and the availability of data reduction techniques (such as factor analysis and cluster analysis) have made it less challenging to incorporate these variables into modelling.

Fourthly, it is clear that micro-economic modelling of tourist expenditure has been Western-centric. The limited research so far has a very strong focus on the U.S. and the U.K. Some of the world's major new and emerging tourist markets have been largely missing from the literature. As these markets, especially the growing Chinese and Indian outbound markets, are expected to continue to impact upon many tourist destinations, an understanding of consumption behaviour in these markets would greatly benefit destinations in yield maximising and product development.

To conclude, this paper attempted to identify the state of current research on micro analysis of tourism demand by reviewing firstly the types of tourism demand analyses, and secondly micro-economic analyses of tourist expenditure. The review indicated that micro-economic modeling of tourism demand is an under-researched area, and future studies should investigate the effect of psychological and destination-related variables on expenditure. This echoes Ryan's (2003) suggestion that, to better understand tourism demand, future analyses need to use "complex models incorporating economic, psychological and sociological factors" (p. 91).

Incorporating a wider range of independent variables may also improve the explanatory power of the model. Future studies should also explore the spending behaviour in new tourist markets and adopt other modelling techniques. It is hoped that this study could provide a practical guide for future micro-economic modelling of tourism demand.

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*Table 1: Frequency Distribution of Years of Publication*

Time period	Frequency
Before 1995	2
1996-1999	4
2000-2004	10
2005 and after	11
Total	27

*Table 2: Frequency Distribution of Sample Sizes*

Number of observations	Frequency
0 up to 500	8
500 up to 1000	5
1000 up to 1500	6
1500 and over	7
Unknown	1
Total	27

*Table 3: Classification of Modelling Methods*

Method	Frequency
Multiple regression models	17
Tobit regression models	2
System of equations	2
General linear models	4
Structural equation modelling	1
Path analysis	1
Total	27

Table 4: Summary of Economic and Socio-demographic Variables

Studies	Income	Price	Time cost	Age of adults	Age of children	No/presence of children in the household	Gender	Household size	Marital status	Race/Ethnicity/Heritage background	Place of residence/Nationality	Education level	Occupation	Working full-time
Agarwal & Yochum (1999)	X			X					X	X				
Agarwal & Yochum (2000)	X	X		X			X							
Asgary et al. (1997)	X	X							X		X	X		
Aguilo Perez & Juaneda Sampol (2000)		X		X							X		X	
Cannon & Ford (2002)	X								X	X	X	X		
Chhabra et al. (2002)	X			X						X		X	X	
Dávila et al. (1999)	X													
Downward & Lumsdon, (2000)	X			X	X									
Downward & Lumsdon, (2003)	X													
Downward & Lumsdon, (2004)														
Henthorne (2000)				X			X							
Jang et al. (2004)	X			X			X						X	
Jang et al. (2005)	X													
Laesser & Crouch (2006)											X			
Lee (2001)	X			X							X			
Lehto et al. (2001)											X			
Lehto et al. (2004)	X			X			X							
Leones et al. (1998)	X			X							X			
Mak et al. (1977)	X	X	X	X					X			X		
Mehmetoglu (2007)	X			X										
Nicolau & Más (2005)	X			X				X	X			X		
Pouta et al. (2006)				X			X							
Seiler et al. (2002)	X			X			X		X			X		
Taylor et al. (1993)	X													
Thrane (2002)	X			X			X	X			X			X
Wang et al. (2006)	X			X		X	X		X					
Wang & Davidson (in press)	X			X		X	X		X		X	X	X	

*Table 5: Summary of the Effect of Age*

Studies	Impact
Agarwal & Yochum (1999)	Insignificant
Agarwal & Yochum (2000)	Insignificant
Aguilo Perez & Juaneda Sampol (2000)	Travellers under 30 spent less
Chhabra et al. (2002)	Insignificant
Downward & Lumsdon, (2000)	Significant joint effect of the number and age of adult travellers
Henthorne (2000)	Older travellers spent more than younger travellers
Jang et al. (2004)	Older travellers spent more than younger travellers
Lee (2001)	Insignificant
Lehto et al. (2004)	Travellers between 20 and 29 spent more than other age groups
Leones et al. (1998)	Insignificant
Mak et al. (1977)	Middle aged travellers spent more
Mehmetoglu (2007)	Older travellers spent more than younger travellers
Nicolau & Más (2005)	Middle aged travellers spent more
Pouta et al. (2006)	Middle aged travellers spent more
Seiler et al. (2002)	Not significant
Thrane (2002)	Older travellers spent more than younger travellers
Wang et al. (2006)	Younger travellers spent more than older travellers
Wang & Davidson (in press)	Middle aged travellers spent more

*Table 6: Summary of the Effect of Marital Status*

Studies	Impact
Agarwal & Yochum (1999)	Insignificant
Asgary et al. (1997)	Married travellers spent less than single travellers
Cannon & Ford (2002)	Insignificant
Mak et al. (1977)	Married travellers spent more than single travellers
Nicolau & Más (2005)	Married travellers spent less than single travellers
Seiler et al. (2002)	Insignificant
Wang et al. (2006)	Insignificant
Wang & Davidson (in press)	Insignificant

Table 7: Summary of Trip-related, Psychological, Destination-related, and other Variables

Categories Studies	Trip-related																				Psychological and destination-related					Other										
	Length of stay	Party size	Presence of Companions	No of adults/male adults/female adults	Presence of children	No of children/male children/female children	Accommodation type	First/repeat visit	Intention to re-visit	Spending over/less 100 pounds	Means of transport	Payment method	No of sites visited	No of trips	Travel distance	Type of trip/tourist	Trip purpose (e.g. holiday, business, etc.)	Mode of travel (e.g. pre-paid package tour)	Reservation type	Reservation time	Items paid for	Information acquisition behaviour	Planning horizon/advanced planning	Stops in other destinations	Tourist activities	Destination type	Travel influence (destination attractors)	Trip motives	Taste	Psychological characteristics	Evaluation of trip/holiday/vendor	Government policy	Seasonality/time or year of visit			
Agarwal & Yochum (1999)	X	X			X	X																														
Agarwal & Yochum (2000)	X	X			X	X																X												X		
Asgary et al. (1997)																																				
Aguilo Perez & Juaneda Sampol (2000)	X	X				X	X											X	X	X											X					
Cannon & Ford (2002)	X	X			X																															
Chhabra et al. (2002)								X							X								X							X						
Dávila et al. (1999)		X								X			X																			X				
Downward & Lumsdon, (2000)	X	X		X	X																															
Downward & Lumsdon, (2003)	X	X																																		
Downward & Lumsdon, (2004)	X	X							X	X																										
Henthorne (2000)	X						X	X																								X			X	
Jang et al. (2004)	X		X	X	X		X				X																									
Jang et al. (2005)																								X												X
Laesser & Crouch (2006)	X	X				X										X										X										
Lehto et al. (2001)						X										X																				
Lehto et al. (2004)			X				X									X	X																			X
Lee (2001)		X			X										X	X										X										
Leones et al. (1998)	X											X			X																					
Mak et al. (1977)	X	X						X								X	X							X												X
Mehmetoglu (2007)	X															X									X			X								
Nicolau & Más (2005)	X					X									X																					
Pouta et al. (2006)	X		X				X			X					X										X	X										
Seiler et al. (2002)	X	X			X	X										X	X																			
Taylor et al. (1993)	X	X				X																X		X												
Thrane (2002)	X																							X				X								
Wang et al. (2006)	X	X		X	X		X							X																				X		
Wang & Davidson (in press)	X	X					X																	X								X				

Figure 1: Types of Tourism Demand Studies

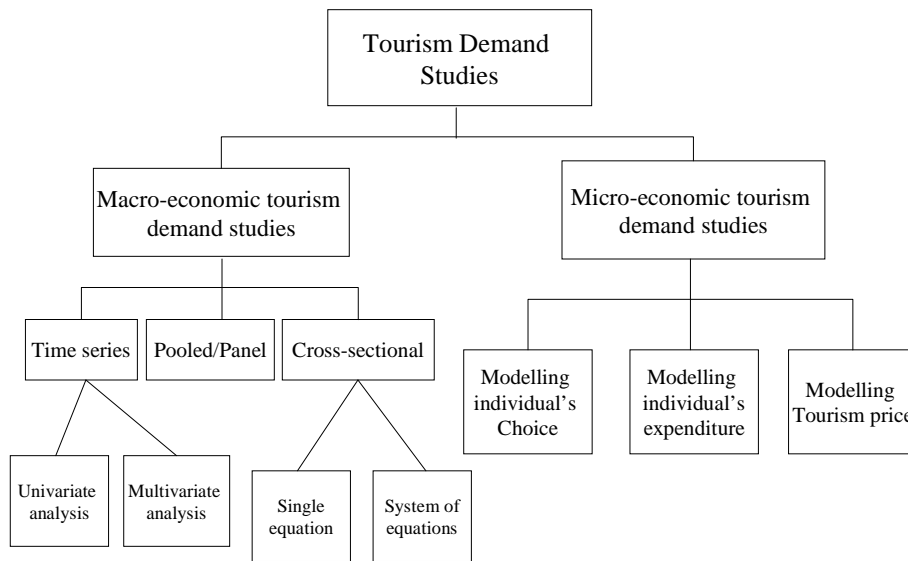


Figure 2: Summary of Dependent Variables

