

# Mainland Chinese and Japanese Tourists in Taiwan: The Travel Mode and Shopping Expenditures

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## Abstract

This paper uses quantile regression to investigate the travel mode and the shopping expenditures of over 7000 Chinese and Japanese tourists interviewed as part of the 2012-2013 Annual Survey Report on Visitor Expenditures and Trends in Taiwan. Results show that most Chinese tourists prefer to travel in group package tours, whereas most Japanese tourists prefer to travel independently. Both Chinese and Japanese tourists traveling in package tours purchase considerably more than individual travelers. Chinese visitors with high disposable income who travel in group tours had the highest shopping expenditures. Travelers over 40, those with college education or with higher income, and females had higher shopping expenditures than tourists in other demographics. Consequently, promotional marketing campaigns focusing on these travel segments could lead to significant increases in consumption and thus benefit Taiwan's tourism industry and economy.

## Keywords

Group Package Tour, Travel Mode, Shopping Expenditures, Foreign Independent Tour, Quantile Regression

## 1. Introduction

Tourism is one of Taiwan's most important industries. According to the Taiwan Tourism Bureau, 9.9 million international tourists visited Taiwan in 2014—an increase of 1.9 million visitors over 2013 [1]. Total foreign exchange income from tourism reached US\$12.3 billion in 2013, an increase of 4.7% from the

previous year [2] [3]. The largest number of international visitors came from China (3,987,152), and the second largest number from Japan (1,634,790). It is predicted that Chinese tourists will spend a record 793 billion Chinese Yuan Renminbi (CNY) in Taiwan by 2017 and that the total number of Chinese tourists visiting Taiwan will reach 200 million by 2020 [4].

Several studies have shown that shopping is one of the prime reasons people choose to travel [5]-[11], as well as one of the major activities undertaken by tourists during their travels [12]. Japanese and Chinese tourists are reported to be comparatively more interested in shopping and have higher shopping expenditures than travelers from other countries [13] [14] [15]. However, spending patterns between Chinese and Japanese tourists differ considerably. According to Taiwan's Tourism Bureau [2], visitors from Japan predominately purchase local specialty products (58.32% of all expenditures), whereas visitors from China are more inclined to purchase jewelry or jade articles (33.66%) and local specialty products (22.31%). Studies have also shown that Chinese tourists put greater emphasis on service quality and expect excellent cultural understanding of their wants and needs [16]. They also tend to pursue top brand name goods, and view traveling to famous destinations as status and prestige boosting activities [17], thus feeling inclined to patronize five-star hotels endorsed by reputable tour operators [18] [19]. In general, China has become one of the largest tourist generating countries in the world, substantially contributing to the rapid growth of the global tourism market [11].

Apart from the increasing global importance of Chinese travelers, travel mode preferences have also changed considerably over the last decade. Tourists from Asian countries, such as China, Japan as well as Korea have traditionally preferred to travel in groups, making group package tours (GPT) their most common mode of travel when visiting Taiwan [20] [21]. However, the international trend is now leaning towards more flexible travel and away from all-inclusive escorted tours [22]. As to Taiwan, changing travel mode patterns have been observable especially among Chinese tourists mostly as a result of by the Taiwanese government's decision to lessen restrictions on individual Chinese travelers. On June 28, 2011, the government implemented the Free Independent Travel (FIT) program (which was expanded in 2013), thereby increasing the previous limit on individual Chinese travelers from 1000 to 2000 visitors a day. The new policy has dramatically increased the number of FIT tourists. In 2014, over 1.2 million Chinese visited Taiwan under the program [1]. Altering travel mode preferences are likely to have significant impacts on tourism and related industries, assuming that individual and GPT travelers have different consumption patterns and travel motives.

This research analyses the changing travel mode preferences and shopping expenditures of Chinese and Japanese visitors to Taiwan. In the following sections, we look at the relevant literature, formulate research hypotheses and explain the applied research methodology. We conclude our study with a discussion on the most important findings of our empirical analysis.

## 2. Review of Literature

Shopping and traveling are interconnected and the relationship between the two phenomena has undergone manifold complex changes. One of the most evident changes is that shopping increasingly emerges outside the consumers' local business communities [23]. Moreover, the notion of shopping has fundamentally shifted. Nowadays, shopping is increasingly viewed as a leisure activity rather than an economic necessity. The dramatic increase in the level of mobility, accelerated by globalization and growing wealth in established as well as in emerging economies, has contributed to this new dynamic [24] [25].

Wessely [26] identified two distinct modalities of shopping behavior in connection with tourism: tourism shopping and shopping tourism. In the first case, shopping only forms part of the overall activities, whereas in the latter it constitutes the explicit aim of traveling. In the past, shopping tourism was described as one of the manifestations of an informal private economy within developing countries [27]. That is travelers, crossed borders to neighboring countries with the objection of obtaining daily necessities or professional services that were either financially less attractive or not available in their home countries [26]. However, shopping as a leisure activity extended these conventional business practices of border economies to the domain of the rapidly increasing experience economy [28] [29], with shopping becoming the main objective of the overall travel experience. Apart from the growing segment of travelers wishing to obtain cheap products abroad there now is also an increasing number of people who desire to experience luxury. In spite of global economic recessions, the luxury market has already become an important segment in the travel and tourism industry [30]. Since tourists are reportedly more likely to purchase luxury products and spend higher amounts of money than local customers at shopping malls and places of public interest and entertainment, shopping tourism has been widely acknowledged as "a primary means of generating tourism revenue and contributing to economic development" [31].

There have been several studies investigating factors determining the consumption behavior of tourists. Lew and Ng [32] established that the level of tourism shopping expenditure is positively influenced by length of stay and number of visits. Wang [33] concluded that repeat visitors are comparatively more engaged in activities related to local culture and life and prefer more social activities, such as shopping, dining or visiting friends and relatives.

Keown [34] found that approximately 80% of Japanese visitors to Hawaii spent more than five hours on shopping. Approximately 30% of their spending was allocated to themselves and 60% to family, friends and work associates. One reason for this is that Japanese travelers are socially obliged to present small gifts to family and friends upon their return from international trips [35]. Other studies have segmented travelers by country. For example, Rosenbaum and Spears [12] studied the differences in travel spending patterns of tourists in Hawaii and found that Japanese tourists spent more on travel expenses, stay longer, and

dedicate more time to shopping than tourists from other countries. Timothy [36] reported that Japanese tourists' most preferred purchases were food, clothing, handbags, tobacco, alcohol, cosmetics, shoes, scarves and handkerchiefs, chocolate and candy, leather products, and souvenir crafts.

Several other studies have revealed that tourists spend approximately one-third of their total travel expenditures on shopping [7] [37], and that shopping expenditures of tourists are positively influenced by socio-economic indicators, such as income, age as well as educational attainment [32] [38] [39] [40]. Moreover, female visitors were reported to spend more than their male counterparts [32].

Although individual travel has become increasingly popular among tourists, replacing conventional group package tours [22], there is a lack of research on the differences and communalities in spending patterns between the two travel modes. This study thus is the first attempt to investigate the relationship between travel mode and shopping expenditures of Chinese and Japanese tourists to Taiwan. In particular, we test the hypotheses that individual tourism has a much lower economic impact than GPT, and that age, gender, income, occupation as well as educational attainment is significant predictors of spending behavior.

Literature on empirical methodology indicates that the ordinary least square (OLS) model and the Tobit model estimates [41] [42] have traditionally been used to study travel consumer expenditures. In recent years, quantile regression (QR) has been adopted in tourism studies to analyze such expenditures. Marrocu, Paci, and Zara [43], for example, investigated tourist expenditure in Sardinia. Hung, Shang, and Wang [44] looked at the behavior of tourism consumption in Taiwan. Lew and Ng [32] analyzed the spending behavior of visitors to Hong Kong, and Chen and Chang [45] studied the influence of travel agents. The ordinary least square (OLS) estimation has traditionally been used to interpret the mean marginal effects of the explanatory variable on travel expenditures [46]; in contrast, QR assesses local behaviors at specific portions of the empirical distribution with reference to location measures rather than mean values [47].

This paper contributes to the literature by adding a QR analysis to highlight the heterogeneity in GPT and FIT travel modes in regard to tourist shopping expenditure. It also uses both linear and quantile regression to analyze the effects of socio-demographic and travel-related factors on the shopping expenditures of tourists from China and Japan with respect to GPT and FIT travel modes. Research results of this study may assist government agencies as well as tourism consultants in drafting policies and market development predictions regarding inbound tourism from China and Japan.

### **3. Research Methodology**

#### **3.1. Data and Variables**

This study analyzed 7720 leisure travelers using data from the 2012 and 2013

Annual Survey Report on Visitor Expenditures and Trends in Taiwan. Tourism Bureau of Taiwan In order to understand the tourism motivation, trends, consumption situations, perceptions and opinions of foreign tourists in Taiwan in the past few years, this survey was conducted to visit departing passengers at Taiwan's Taoyuan International Airport, Kaohsiung International Airport, and Songshan Airport respectively. Seventy percent (5688) of the respondents were from China and 28% (2302) from Japan. Quota sampling was applied to achieve both random and sample representatives by controlling employment standards and the characteristics of inbound visitors.

Indicators used in this study were divided into three types: socio-demographic indicators, travel-related indicators, and shopping expenditures. Socio-demographic indicators included gender, age, place of residence, occupation, educational attainment, and income (see **Table 1**).

Travel-related indicators included visitor's travel mode choice, traveling with family members, length of stay, visitor's satisfaction scores, and previous travel experience. Travel mode choice was classified into group package tour (GPT) and free independent travel (FIT). FIT travelers were defined as those who only used a travel agency to book their accommodation and transportation. A 5-point Likert scale was employed to survey satisfaction with travel agencies and local tour operators. A distinction was also made between repeat visitors (those who had visited Taiwan during the previous three years) and first-time travelers. The last section of the questionnaire analyzed shopping expenditures consisting of clothing and accessories, jewelry, jade articles, local specialties, souvenirs, handicrafts, cigarettes, liquor, and medicine. The descriptive statistics are summarized in **Table 1**.

### 3.2. Model Specification and Methodology

At the household or family level, economic theory typically depicts consumption level as being determined by socioeconomic and travel-related factors [32] [43]. In this study, we adopted individual per-day shopping expenditures as the dependent variable and two distinct groups as independent variables: 1) socio-demographic factors such as gender, age, education, occupation, personal income, and residence; and 2) travel-related factors. The latter included traveling with family members, travel satisfaction, and repeat visitor experience. The following empirical model for tourist shopping expenditure was used:

$$Y_{ij} = f(X_{ij})$$

where  $i = 1, 2, 3, 4$  denotes the four main categories of tourists and  $j = 1, \dots, N$  the  $i$ th individual.  $Y$  is the per tourist per day shopping expenditure.  $X$  is the two categories of explanatory variables consisting of both socio-demographic and travel-related factors. **Table 1** contains the variable definitions and their explanations.

This paper applied least squares regression (LSR) as well as quantile regression. STATA 12 software package was used for the analysis.

**Table 1.** Definition and explanation of variables in empirical models.

Variable	Definition	Explanation
Dependent variables		
<i>Y</i>	Shopping expenditures	Shopping expenditures during their current trip (US\$/per tourist per day).
Independent variables		
Travel-related factors		
GPT	Visitor's travel model choice is group package tour	Dummy, 1 if visitor's model choice is group package tour and 0 otherwise
Travel repeat	Travel repeat within three years	Dummy, 1 if visitor has travel repeat to Taiwan within three years and 0 otherwise
Traveling with family members or friends	Visitor's traveling has family members or friends on the trip	Dummy, 1 if visitor has family members or friends on the trip and 0 otherwise
Tourist's satisfaction	Visitor's satisfaction scores	Visitor's satisfaction scores on travel agents and tour guide services. Ranging 1 - 5 from strongly negative to strongly positive evaluation
Socio-demographic		
Central	Visitor's residence is in the central area of China	Dummy, 1 if visitor's residence is in the north area of China and 0 otherwise
South	Visitor's residence is in the southern area of China	Dummy, 1 if visitor's residence is in the southern area of China and 0 otherwise
Hong Kong and Macao	Visitor's residence is in the Hong Kong or Macao	Dummy, 1 if visitor's residence is in the Hong Kong or Macao and 0 otherwise
Male	Visitor is male	Dummy, 1 if visitor is male and 0 if visitor is female
Age 30 - 39 years	Visitor is age 30 - 39 years	Dummy, 1 if visitor is age 30 - 39 years and 0 otherwise
Age 40 - 59 years	Visitor is age 40 - 59	Dummy, 1 if visitor is age 40 - 59 and 0 otherwise
Age Over 60 years	Visitor is over 60 years	Dummy, 1 if visitor is over 60 years and 0 otherwise
Income < US\$29,999	Visitor's personal annual income level is lower than US\$29,999 per year	Dummy, 1 if visitor's personal annual income level is lower than US\$29,999 per year and 0 otherwise
Income US\$30,000 - 69,999	Visitor's personal annual income level is US\$30,000 - 69,999 per year	Dummy, 1 if visitor's personal annual income level is US\$30,000 - 69,999 per year and 0 otherwise
Income US\$70,000 - 99,999	Visitor's personal annual income level is US\$70,000 - 99,999 per year	Dummy, 1 if visitor's personal annual income level is US\$70,000 - 99,999 per year and 0 otherwise
Secondary/High School	The visitor's education level is secondary/high school	Dummy, 1 if visitor's education level is high/vocational school and 0 otherwise
College or above	The visitor's education level is college or above	Dummy, 1 if visitor's education level is college or above and 0 otherwise
Professional/Proprietor	Visitor's occupation is professional or proprietor	Dummy, 1 if visitor's occupation is professional or proprietor and 0 otherwise
Junior White Collar	Visitor's occupation is junior white collar occupation	Dummy, 1 if visitor's occupation is junior white collar and 0 otherwise
Blue Collar	Visitor's occupation is blue collar	Dummy, 1 if visitor's occupation is blue collar and 0 otherwise

Since QR can describe the behavior of each quantile in the conditional distribution of explained variables, its coefficients can show the degree of influence of explanatory variables on different explained variable quantiles. LSR can only provide the mean, whereas QR can provide the estimations of different quantiles. It thus allows for a clearer description of the complete distribution state of explained variables. At the same time, QR can also address the problem of data heteroscedasticity.

The QR method used by Lew and Ng [32] is shown below. Given  $n$  observations of the dependent variable  $y_i$ , and  $k$  independent variables represented by the  $k$  vector  $x_i$  or  $i = 1, \dots, n$ , the  $k$  vector of  $\tau$ th quantile regression coefficients,  $\beta(\theta)$ , minimizes:

$$\min_{\beta(\theta)} \sum_{y_i - x_i \beta(\theta) \geq 0} \theta |y_i - x_i \beta(\theta)| + \sum_{y_i - x_i \beta(\theta) < 0} (1 - \theta) |y_i - x_i \beta(\theta)|$$

where  $\theta$  is the quantile to be estimated, ranging between 0 and 1. The  $\theta$  value near zero implies more weight on negative residuals. At the other extreme—with highest  $\theta$  values—it indicates more weight on positive residuals.

The estimator of the regression equation parameter is:

$$\hat{\beta}(\theta) = \min_{\beta(\theta)} \sum_{y_i \geq x_i \beta(\theta)} \theta |y_i - x_i \beta(\theta)| + \sum_{y_i < x_i \beta(\theta)} (1 - \theta) |y_i - x_i \beta(\theta)|$$

This means that  $\hat{\beta}(\theta)$  can be solved provided  $\theta$  is given. Hence, any of the  $k$  components of the quantile regression coefficients  $\hat{\beta}(\theta)$  provide an estimate of the marginal effect of the associated independent variable  $x_i$  on the dependent variable for the  $\tau$ th quantile of the cohort holding the effects of the remaining independent variables fixed. Because QR coefficients are typically computed by a linear program, a simple method can be applied [32].

## 4. Results

The descriptive statistics of the samples are presented in **Table 2**. This study found that the majority of Chinese tourists (57.9%) who traveled to Taiwan chose a group package tour, whereas the majority of Japanese tourists (63.1%) preferred free independent travel. The largest cohort of Chinese visitors (27.0%) was in the 20- to 29-year-old age category. Chinese FIT tourists were significantly older than GPT visitors, and Japanese tourists were slightly older than Chinese visitors. Those with college education and above comprised the largest percentage of travelers from both China (76.1) and Japan (82.1%).

The majority of Chinese tourists were professionals/proprietors (FIT: 39.7; GPT: 38.7%), whereas the majority of Japanese tourists had blue collar jobs (FIT: 47.2; GPT: 41.3 %). In terms of income, the largest group of Chinese tourists (26.4%) belonged to the less than US\$9999 cohort, whereas the largest group of Japanese travelers (26.3%) had an annual income of US\$40,000 - 69,999. In regard to residence, the largest percentage of Chinese travelers (39.4%) came from Central China.

**Table 2.** Profile of visitor characteristics.

Variable	China			$\chi^2$ test	Japan			$\chi^2$ test
	Foreign Individual Tour (%)	Group Package Tour (%)	All visitors (%)		Foreign Individual Tour (%)	Group Package Tour (%)	All visitors (%)	
	(n = 2397)	(n = 3291)	(n = 5688)		(n = 1283)	(n = 749)	(n = 2032)	
Socio-demographic								
Gender								
Male	40.1	37.2	38.4	4.5**	51.6	43.3	48.5	12.7**
Female	59.9	62.7	61.6		48.4	56.6	51.4	
Age								
12 - 19 years	4.84	3.2	3.94	538.9**	1.3	1.2	1.2	94.7**
20 - 29 years	39.3	18.0	27.0		23.7	17.4	21.4	
30 - 39 years	26.8	20.7	23.3		26.7	16.0	22.7	
40 - 49 years	14.3	25.7	20.9		21.9	18.6	20.7	
50 - 59 years	9.5	17.8	14.3		12.1	19.3	14.8	
Over 60 years	5.0	14.3	10.4		14.1	27.2	18.9	
Education								
Primary Education or Below	1.5	2.4	2.0	16.4**	0.9	1.3	1.1	7.3
Secondary/High School	19.8	23.3	21.8		15.5	18.8	16.7	
College or above	78.6	74.3	76.1		83.4	79.8	82.1	
Occupation								
Professional/Proprietor	39.7	38.7	39.1	37.3**	32.1	24.1	29.1	50.0**
Junior White Collar	2.4	3.4	3.0		0.4	0.2	0.3	
Blue Collar	36.3	30.6	33.0		47.2	41.3	45.0	
Others (House keeper, Students, and Retired)	21.4	27.2	24.8		20.2	34.1	25.3	
Personal income								
<US\$9999	16.4	33.7	26.4	437.8**	0.5	0.4	0.4	47.1**
US\$10,000 - 14,999	18.0	20.5	19.5		2.4	2.2	2.3	
US\$15,000 - 29,999	22.9	14.7	18.1		6.3	10.5	7.9	
US\$30,000 - 39,999	10.1	4.1	6.6		20.5	15.6	18.7	
US\$40,000 - 69,999	7.6	2.7	4.8		27.4	24.4	26.3	
US\$70,000 - 99,999	2.4	0.7	1.4		16.3	12.8	15.0	
Over US\$100,000	3.3	0.8	1.9		7.0	4.67	6.1	
No fixed income	19.1	22.5	21.1		19.3	29.2	22.9	
Residence								
Northern China	11.6	15.8	14.0	1900**				
Central China	22.0	52.1	39.4					
Southern China	8.4	25.8	18.5					



## Continued

Hong Kong and Macao	57.8	6.2	27.9					
Travel-related								
Traveling with family members or friends								
Yes	85.3	96.5	91.8	230.8**	69.8	97.8	80.1	232.7**
No	14.6	3.4	8.1		30.1	2.1	19.8	
Length of stay (days)	6.6	6.4	6.5		4.6	2.7	3.9	
Tourist's satisfaction	4.3	4.4	4.4		4.3	4.2	4.2	
Travel repeat								
Yes	43.2	3.7	20.4	1300**	52.7	22.1	41.4	182.4**
No	56.7	96.2	79.5		47.2	77.8	58.5	
Travel shopping expenditures (US\$)								
Clothing, accessories, and cosmetic	39.7	44.6	42.5		14.3	25.3	18.4	
Jewelry, jade articles, souvenirs, and handicrafts	17.9	72.7	49.6		3.4	14.0	7.3	
Local specialties and tea	35.0	52.9	45.3		38.2	73.6	51.2	
Cigarettes and liquor	1.8	7.3	5.0		0.6	2.6	1.3	
3C (Computer, consume electronics, and communication)	2.6	5.8	4.4		0.3	0.1	0.2	
Other	3.8	4.0	3.9		2.0	0.8	1.5	
Total shopping expenditures	101.0	188.6	151.7		58.9	116.6	80.2	

NOTES: \*\*Denotes 5% levels of significance respectively.

The average shopping expenditure per tourist per day was US\$151.70 for Chinese tourists and US\$80.20 for Japanese tourists. Chinese GPT travelers had the highest average expenditure per tourist per day (US\$188.60); the highest average expenditure for Japanese tourists (US\$116.60) was also made by GPT travelers. Japanese FIT travelers had the lowest average expenditure (US\$58.90) per person per day.

The average Chinese tourist in our sample spent US\$42.50 per day on clothing and accessories; US\$49.60 on jewelry, jade articles, souvenirs, and handicrafts; and US\$45.30 on local specialties and tea. Considerably less money was spent per day on cigarettes, liquor, and medicine (US\$5.00) and on computer, consumer electronics, and communications (US\$4.40). Chinese GPT visitors spent an average of US\$72.70 on jewelry, jade articles, souvenirs, and handicrafts. Chinese FIT tourists preferred to buy clothing, accessories, and cosmetics. **Table 2** reveals a rather different consumption behavior among Japanese tourists, who spent most of their money on tea and other local specialties.

In **Table 3** and **Table 4**, we report the results obtained by applying linear regression and quantile regression with nine conditional quantiles ( $\theta = 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, \text{ and } 0.9$ ) with shopping expenditure as the dependent

**Table 3.** Estimated coefficients for LSR and QR on shopping expenditure. Dependent variable: mainland Chinese shopping expenditure per tourist per day.

Variables	LSR	QR			
		0.1	0.2	0.3	0.4
GPT	29.016**	15.414**	22.549**	27.773**	33.548**
Travel repeat	27.068	-1.572	0.479	1.248	3.146
Traveling with family members or friends	51.914**	4.868**	6.996**	9.312**	9.192**
Satisfaction	-17.205	0.743	0.552	0.359	0.691
Central area of China	7.926	4.835**	8.057**	13.296**	20.178**
South area of China	34.903**	5.068**	7.643**	17.384**	24.712**
Hong Kong and Macao	-117.262**	-0.922	-1.752	-1.619	-2.515
Male	-0.888	-2.806**	-4.010**	-5.588**	-5.576**
Age 30 - 39 years	-0.496	0.860	1.865	2.327	1.366
Age 40 - 59 years	51.816**	3.667**	7.351**	9.600**	15.260**
Age Over 60 years	7.770	-0.108	-0.414	1.865	2.500
<US\$29,999	-6.946	0.6422	-0.172	1.418	1.632
US\$30,000 - 69,999	77.776**	2.642	1.949	6.301	4.654
US\$70,000 - 99,999	161.238**	4.017	6.492	9.728	14.228
Secondary/High School	-26.656	1.572	0.940	2.697	2.831
College or above	45.060	25.024**	17.578**	18.234**	11.852
Professional/Proprietor	25.973	6.691**	7.801**	9.116**	15.046**
Junior White Collar	-4.875	7.454**	8.628**	7.384	7.716
Blue Collar	9.824	5.820**	8.075**	8.751**	12.876**
Intercept	165.862**	-4.015	0.018	0.511	2.283
Variables	QR				
	0.5	0.6	0.7	0.8	0.9
GPT	38.530**	43.207**	54.700**	62.977**	63.468**
Travel repeat	5.0255**	4.838	2.744	12.101	7.855
Traveling with family members or friends	12.158**	14.227**	14.050**	16.957**	25.172
Satisfaction	-0.100	-1.552	-3.631	-12.248**	-7.971
Central area of China	27.135**	34.297**	51.223**	56.783**	65.035**
South area of China	30.244**	36.424**	51.081**	57.989**	92.319**
Hong Kong and Macao	-5.942	-12.860**	-16.130**	-43.696**	-101.355**
Male	-6.9959**	-5.521**	-8.628**	-9.696	-13.671
Age 30 - 39 years	3.163	1.552	5.131	11.004	12.915
Age 40 - 59 years	17.018**	22.834**	33.743**	48.468**	76.157**
Age Over 60 years	3.621	-1.208	4.027	4.9341	-0.778
<US\$ 29,999	0.632	-0.060	-4.103	-8.158	-16.134
US\$30,000 - 69,999	6.784	8.474	13.484	32.185**	64.578**
US\$70,000 - 99,999	27.250	52.683**	66.263**	166.494**	277.302**
Secondary/High School	2.874	-2.669	-19.879	-1.645	-112.466
College or above	5.196	-0.7389	-14.386	-12.195	-25.303
Professional/Proprietor	17.136**	25.806**	34.191**	27.601**	69.988**
Junior White Collar	6.196	5.842	21.814	14.712	37.952
Blue Collar	15.633**	19.689**	28.624**	21.175**	42.704**
Intercept	11.568	33.065	71.269**	133.683**	304.335**
Pseudo R2	0.0624	0.0658	0.0727	0.0793	0.0890

Number of observations 5688. Unless otherwise indicated, all explanatory variables are expressed as dummy variables. Estimation method: Quantile Regressions. Significance based on bootstrapped standard errors (1000 replications): \*\*5%.

**Table 4.** Estimated coefficients for LSR and QR on shopping expenditure. Dependent variable: Japanese shopping expenditure per tourist per day.

Variables	LSR	QR			
		0.1	0.2	0.3	0.4
GPT	54.606**	9.840**	14.823**	21.268**	25.577**
Travel repeat	-1.055	-1.158	-2.362	-1.554	-2.246
Traveling with family members or friends	12.619	3.204**	4.303**	6.519**	7.562**
Satisfaction	-0.219	0.921	0.696	0.536	-8.99e-09
Male	-26.192**	-2.934**	-4.731**	-7.071**	-10.362**
Age 30 - 39 years	-17.086	0.4974	-0.270	-2.157	-2.676
Age 40 - 59 years	-2.174	3.431**	3.992**	4.169	2.742
Age Over 60 years	-0.2531	3.725**	2.616	2.702	4.410
<US\$29,999	28.879	0.272	2.041	-0.0738	-1.916
US\$30,000 - 69,999	5.304	4.019	6.786**	5.287	5.740
US\$70,000 - 99,999	28.791	3.8978	7.681**	6.996	5.983
Secondary/High School	-27.082	16.416	-5.742	-25.636	-13.005
College or above	82.186	-7.091	3.927	20.413	19.273
Professional/Proprietor	32.483	-0.163	-0.737	3.074	8.978
Junior White Collar	19.964	-0.3070	-2.674	-3.837	0.269
Blue Collar	5.320	0.0285	-1.848	1.127	4.572
Intercept	65.174	-17.965	9.515	34.225	28.400

Variables	QR				
	0.5	0.6	0.7	0.8	0.9
GPT	34.567**	41.862**	57.437**	70.191**	82.954**
Travel repeat	-1.986	-1.989	-3.391	-1.364	-3.488
Traveling with family members or friends	8.1961**	8.827**	8.329	10.278	23.690**
Satisfaction	0.360	1.010	1.50e-08	-0.964	-3.229
Male	-12.879**	-15.110**	-17.573**	-29.938**	-33.767**
Age 30 - 39 years	-5.688**	-3.600	-2.509	-1.364	-5.177
Age 40 - 59 years	2.210	7.732	14.652**	11.309	-7.215
Age Over 60 years	5.273	4.756	7.324	18.440	17.701
<US\$29,999	-3.415	0.3944	11.365	25.851	40.835
US\$30,000 - 69,999	2.633	6.339	19.232	28.424	39.858
US\$70,000 - 99,999	4.906	8.852	24.355	42.729**	104.405**
Secondary/High School	-24.337	-14.793	25.906	62.539	-380.565
College or above	19.779	100.830	113.023	168.95	152.991
Professional/Proprietor	17.921**	17.953	7.028	11.787	34.412
Junior White Collar	3.463	-3.590	-18.960	-37.650	17.928
Blue Collar	10.245	9.234	-5.779	-12.862	-15.380
Intercept	43.162	36.704	13.060	-1.025	474.952
Pseudo R2	0.0581	0.0597	0.0700	0.0780	0.0817

Number of observations 2032. Unless otherwise indicated, all explanatory variables are expressed as dummy variables. Estimation method: Quantile Regressions. Significance based on bootstrapped standard errors (1000 replications): \*\*5%.

variable. **Table 3** shows that when using LSR to estimate shopping expenditures, the estimated coefficients for Chinese tourists who travel via group package tours, travel with family members, reside in southern China, are aged 40-59 years old, and have income levels of US\$30,000 - 69,999 or US\$70,000 - 99,999 is positive and reaches the 5% level of significance. The estimated coefficient of the US\$70,000 - 99,999 income level is the highest (161.23) among the model's independent variables, which means that the average shopping expenditure of Chinese tourists belonging to this income group is US\$161.23 higher than those of other income level groups.

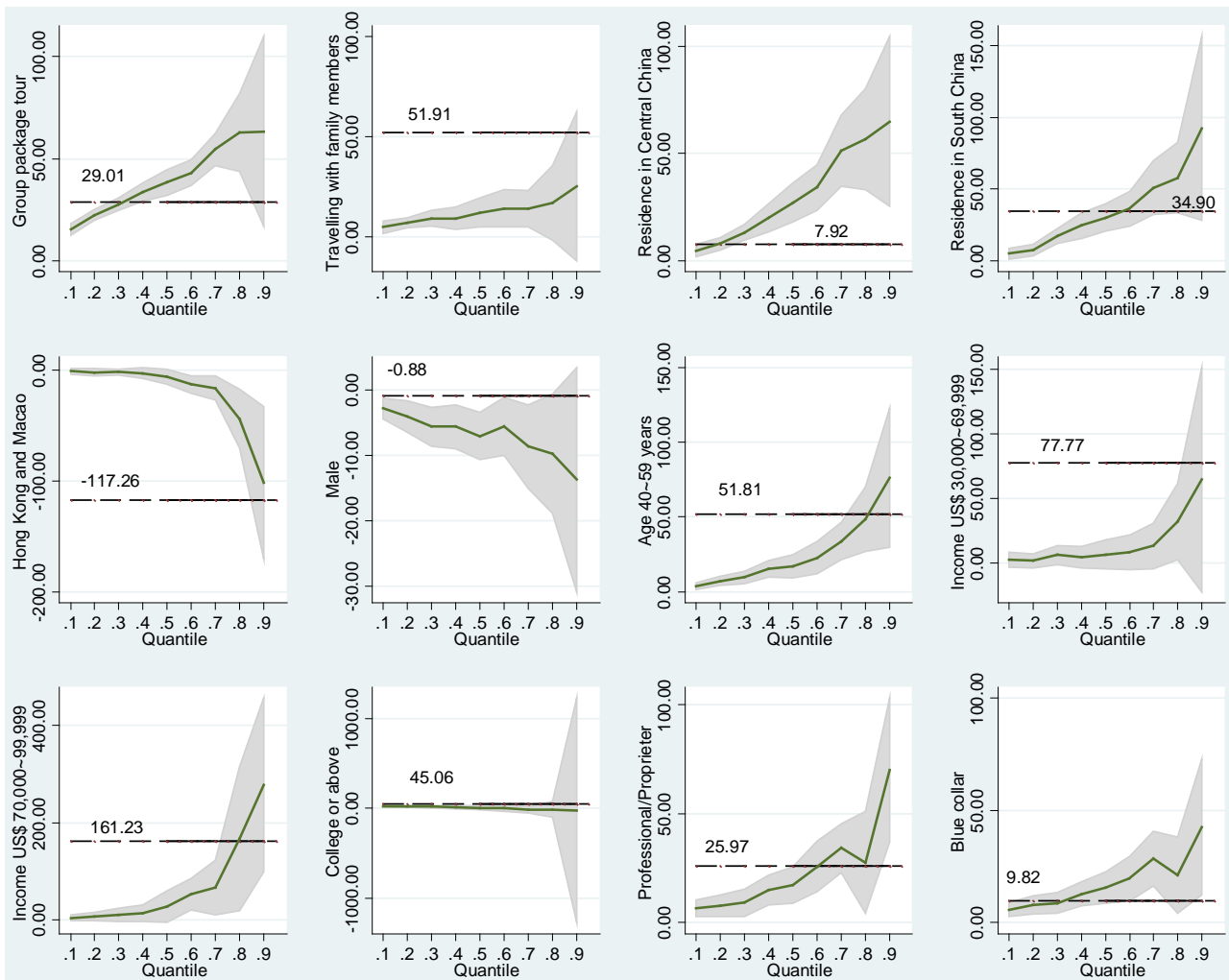
The estimated coefficient for Japanese tourists who travel via group package tour is positive and the highest (54.6) among the model's independent variables. This means that the average shopping expenditure of Japanese GPT tourists is US\$54.60 higher than that of Japanese FIT tourists (see **Table 4**).

In using QR for estimation, when the conditional quantile is at  $\theta = 0.1 - 0.9$ , the estimated coefficient for Chinese tourists who travel by GPT is positive and reaches the 5% level of significance. This implies that the average shopping expenditures of the 0.1 to 0.9 quantile of GPT tourists was US\$15.414 to \$63.468 higher than for free independent travelers (**Table 3** and **Figure 1**, first row, first panel). Total shopping expenditure of the upper 10% is 2.18 times the total shopping expenditure of the LSR-estimated average shopping expenditure of US\$29.016.

In using QR for estimation, when the conditional quantile is at  $\theta = 0.9$ , the estimated coefficient of the US\$70,000 - 99,999 income level is positive and the highest (277.302). This means that the average shopping expenditure of the upper 10% of tourists in the US\$70,000 - 99,999 income level was US\$277.302 higher than that of tourists at other income levels (**Table 3** and **Figure 1**, third row, first panel). The average shopping expenditure among the 0.1 to 0.9 quantile of professional/proprietor tourists was US\$6.691 to US\$69.988 higher than that of tourists with other occupations (see **Table 3** and **Figure 1**, third row, third panel). This occupational dependency is in line with previous research findings [32] [48].

Travelers aged 40 to 59 spent significantly more than travelers of any other age group over the entire spectrum of quantiles, with incremental spending being higher for the higher quantiles. In this respect, our findings differ from those of Wang *et al.* [48] as well as from Lew and Ng [32], which found that Chinese tourists aged 26 to 40 had higher shopping expenditures than other age groups when visiting Hong Kong. This discrepancy could be due to the fact that Chinese prefer to use GPT to travel to Taiwan and FIT to travel to Hong Kong. Furthermore, GPT customers tend to be older than FIT travelers and prefer to buy more expensive items, such as jewelry, jade articles, and local specialties.

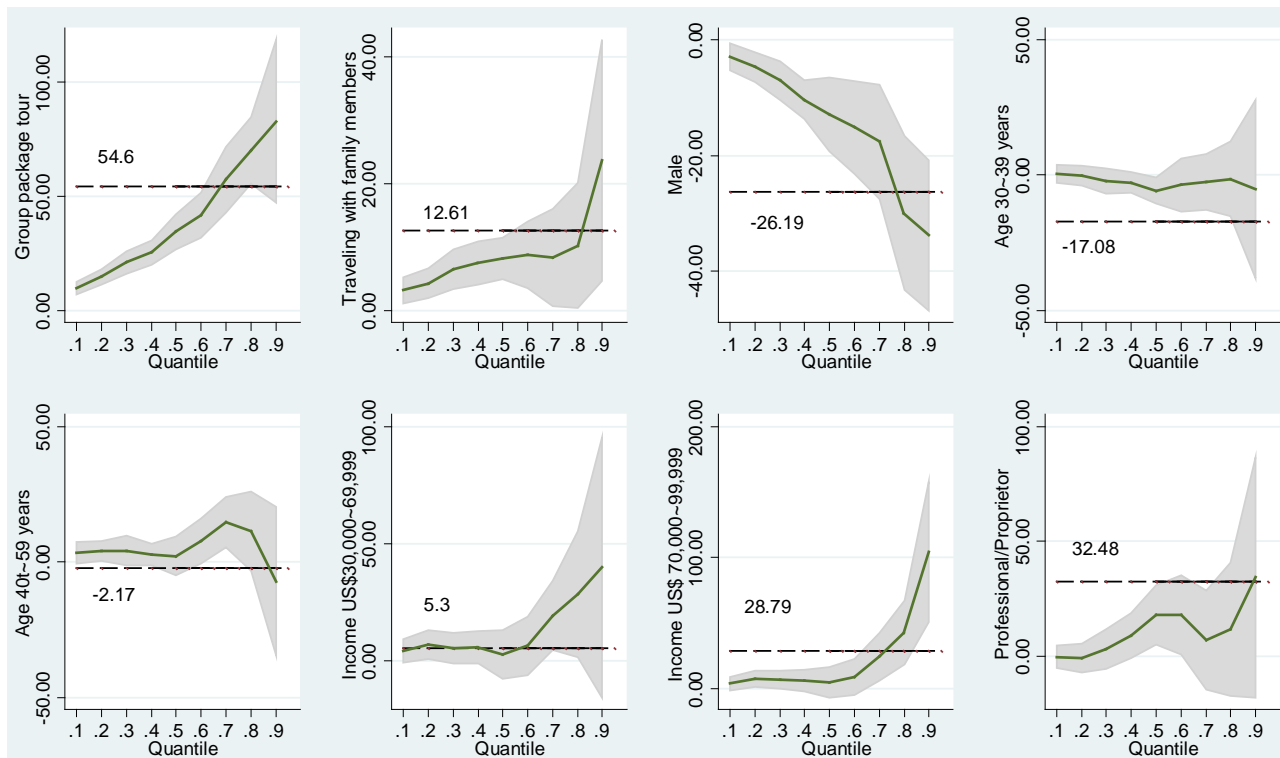
In using QR for estimation, when the conditional quantile is at  $\theta = 0.7 - 0.9$  (reflecting the upper 30% of shopping spending), the estimated value for Japanese GPT tourists is positive (see **Table 4** and **Figure 2**, first row, first panel)



**Figure 1.** The influences of travel mode, socio-demographics, and travel characteristic factors on mainland Chinese tourist shopping expenditure.

and significantly greater than that for the LSR estimate. This implies that the average shopping expenditures for the upper 30% of tourists who travel by group package tour is US\$57.437 to 82.954 higher than that for FIT tourists, which is greater than the LSR-estimated average shopping expenditure of US\$54.606.

Japanese tourists traveling with family members or friends consumed significantly more than individual visitors. (Results were insignificant only at  $\theta = 0.7 - 0.8$ .) When the conditional quantile is at  $\theta = 0.8 - 0.9$ , the estimated value for male Japanese tourists is negative (see **Table 4** and **Figure 2**, first row, third panel) and significantly greater than that for the LSR estimate. This implies that the average shopping expenditure of the upper 20% of male tourists was US\$29.938 to 33.767 less than that for female tourists. This gender difference is in line with previous research suggesting that women are more likely to choose a destination in order to shop or visit friends and relatives [49]. These findings also confirm previous evidence on the relevance of income as one of the most important drivers of Japanese tourist shopping expenditure [14]. In addition, the



**Figure 2.** The influences of travel mode, socio-demographics, and travel characteristic factors on Japanese tourist shopping expenditure.

findings show that the daily shopping expenditure of the upper ten percent of Chinese tourists averaged US\$277.30, whereas the daily shopping expenditure of Japanese visitors on consumer goods was US\$104.40. Thus, Chinese tourists offer the Taiwanese tourism industry considerably more business opportunities than their Japanese counterparts.

## 5. Conclusions

This study found that the majority of Chinese tourists (57.9%) choose GPT as their preferred travel mode, whereas Japanese tourists (63.1%) strongly favor FIT. The Japanese preference contradicts findings of previous studies, such as those by Kim and Lee [50], which suggest that Japanese prefer group travel. QR estimated coefficients for the entire spectrum of quantiles show that both Japanese and Chinese GPT travelers have higher expenditures than FIT visitors. Higher spending behavior is also more common among visitors with professional/proprietor backgrounds and those traveling with family or friends.

Although the latter reflects previous findings by Lew and Ng [32], this study provides evidence that income is a crucial determinant of spending behavior among Chinese tourists. GPT visitors of the highest income cohort (US\$70,000 - 99,999) spent considerably more money during their trip to Taiwan than other mainland Chinese tourists. Moreover, Chinese travelers aged 40 to 59 years spent significantly more than tourists of other age groups. The latter finding differs from those of Wang *et al.* [48] and Lew and Ng [32], which showed that

Chinese tourists aged 26 to 40 had higher shopping expenditures than other age groups when visiting Hong Kong. As explained above, however, this discrepancy could be due to the fact that Chinese tourists prefer GPT when traveling to Taiwan and FIT when traveling to Hong Kong. Furthermore, GPT customers tend to be older than FIT travelers and buy more expensive items, such as jewelry, jade articles, and local specialties.

For cultural reasons, Japanese visitors (both GPT and FIT) spent over 60% of their total expenditures on buying tea or other local specialties as gifts for family members and friends. Quantile regression estimates suggest that Japanese GPT tourists with a university degree who are over 40 had higher expenditures than other visitors.

These findings have some important marketing implications for the tourism industry. Tour operators, for example, could take advantage of Japanese gift buying behavior and provide more time and opportunities for Japanese GPT visitors to purchase such products. In addition, marketing messages should target middle-aged members of social clubs, alumni associations and business cooperatives to encourage group travel. Additional segments to target include Japanese FIT visitors with income levels above US\$70,000, female travelers, and those traveling with friends or family members. For example, potential female FIT tourists could be provided with special information regarding wellness, clothing and other products and services.

In recent years, the number of Chinese FIT visitors has increased dramatically and become an important segment of the tourism market. Most mainland Chinese FIT tourists are aged 20 to 39 years and tend to purchase clothing, accessories, cosmetics and local specialties. According to our quantile regression analysis, mainland Chinese FIT visitors at the 0.9 quantile of the upper income cohort (US\$70,000 - 99,999) had the highest spending levels. Expenditures of professional/proprietor FIT tourists increased at higher quantiles. Consequently, destination managers could target this segment and create marketing materials focused on high quality, higher priced products, and services. This could be an effective strategy because luxury items sold in Taiwan are more likely to be authentic and significantly cheaper than in mainland China.

Another important variable in helping to segment the tourism market is educational attainment. Mainland Chinese travelers with a university degree exhibit higher spending at the 0.1 to 0.3 quantiles than other travelers. This group of visitors mostly consists of young people with lower disposable income who choose FIT as their preferred travel mode, obtain travel information online, stay at budget hotels in the Taipei area, and like to go shopping in the popular Hsinmending area of the city.

This study has confirmed the usefulness of quantile regression techniques in discovering different marginal effects that are not immediately obvious. As pointed out in the literature, QR's ability to highlight the significance of each independent variable on the dependent variable across the full spectrum of the distribution is especially helpful in exploring the spending behavior of tourists

[43]. This salient feature allows policy makers to better allocate marketing resources. However, as Lew and Ng [32] emphasize, the quantile regression technique has its limitations. For example, further segmentation of heavy spenders based on their socio-economic characteristics would require the application of other methods of analysis, such as the CHAID approach [51].

This study focused solely on the spending behavior of Japanese and Chinese tourists; additional studies could also be conducted on the spending behavior of tourists from other countries visiting Taiwan. Furthermore, this study did not investigate other influential factors, such as buying motives or environmental circumstances, which could also be the focus of future research.

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