



# Exploring cruise ship passengers' spending patterns in two Uruguayan ports of call

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## Abstract

The cruise industry has become a significant component of the Uruguayan tourism economy in the last few years. The present study aims to provide a better understanding of the cruise industry by considering the expenditure of cruise ship passengers disembarking in the ports of call of Montevideo and Punta del Este as a key variable in the economic analysis of the cost and benefits. We estimate two cross-sectional regression models for the cruise expenditures, showing that the group sizes the visitors travel with and the mobility the visitors have within the country are the most important variables to explain individual expenditure behavior. Also, we include some managerial recommendations that policy makers could implement in order to improve the economic profits derived from cruise ship tourism.

**Keywords:** cruise industry; Uruguay; cruise passengers' expenditure; Logit; Tobit

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## **1. Introduction**

Cruise tourism can be traced back to the beginning of the 1960s coinciding with the decline of transoceanic ship travel and the introduction of the first nonstop air travels between USA and Europe. The 1970s and 1980s were a period of a moderate growth, increasing from half a million passengers in 1970 to 1.4 million passengers in 1980 and 3.8 million passengers in 1990. In the 1990s cruise tourism reached Europe, Asia and Oceania and started a period of high growth. The cruise industry is, in general, an under-researched subject in need of careful study. Cruise tourism today is completely different from what it was, say, in the 1970s. The sector has been experiencing an explosive increase with a maintained average annual growth rate around 8% in the number of worldwide cruise passengers since 1989 (WTO, 2008). Despite this, the relative significance of cruise voyages in the tourism industry is still rather modest. The contribution of the cruise sector in the international worldwide tourism corresponds to 1.6% of the total number of tourists and 1.9% of the total number of nights (Brida and Zapata-Aguirre, 2010). Cruise ships are among the most preferred types of settings for vacation, which consistently receives top marks (CLIA, 2010).

Cruises represent the paradigm of globalization: physical mobility, international capital that can be relocated anywhere and at any time, crews coming from different countries on the same ship, no national or international regulations, and marine registrations optimally selected. A cruise ship represents all four faces of the tourism industry: transportation, accommodation (including food and beverages), attractions and tour operators. Thirteen million people have taken a cruise in 2008, with the industry predicting that more than 30 million people will do so in 2015 (CLIA, 2010). Cruise tourism can benefit a destination by increasing or improving foreign exchange earnings,

profit, taxes, employment, positive externalities and economies of scale (Dwyer and Forsyth, 1998).

There are several potential benefits of cruise tourism to a destination. Possibly, this is the reason why destinations may be interested in being part of the selected group of port chosen by major cruise lines (Lekakou et al., 2009). Similar argument is raised by policy makers to spend millions of dollars building new cruise ship terminals and expanding their infrastructure (Brida et al., 2011). However, there are also negative aspects such as: the cost to support cruise tourism, including docking facilities, displacing or replacing shipping and cargo handling facilities (Dwyer and Forsyth, 1998); the cost of ensuring transport and public security in the destination, emergency medical services, enhancing streets and attractions; the cost of canceling or changing itineraries for a port; in the long term, the damage of marine life and the cost to preserve the destination tourism inventories (Brida et al., 2012b; Diedrich, 2010).

In Uruguay, cruise tourism is a small but increasingly important segment of the tourism sector, accounting for approximately 10% of international visitors to the country. A lack of objective information regarding the economic issues surrounding the cruise tourism industry is increasingly evident (Bresson and Logossah, 2011), and no published accounts exist of the role of the cruise industry in Uruguay. To determine the economic impacts of the cruise activity on a destination, it is important to understand the different types of cruise related expenditure. These include passenger and crew-related expenditure (retail spending during the visit, pre/post-cruise expenditure, shore excursions, incidentals, provision, departure tax), Vessel-related expenditure (passenger embarkation charges, fuel costs, port dues, port agency fees, piloting, water, garbage, stevedoring, towage, miscellaneous expenses, dry dock charges, State conservancy

dues) and supporting expenditure which includes direct payments by ship owners into the destination (see Dwyer et al., 2004 and Douglas and Douglas, 2004).

In this paper it is assumed that cruise tourists makes two type of decisions related to their expenditures: extensive and intensive decisions. During his trip a tourist can spend in tours, food and beverage, souvenirs, jewels or any other concept. The extensive decision is the decision of spending in one or more of these concepts. The intensive decision is related to how much of the budget is spent in each concept. The present paper considers the cruising expenditure in Uruguay as a key variable in the economic analysis of the cost and benefits associated with the cruise industry. Logit and Tobit models are used to explore the extensive and intensive decision respectively. We applied a rarely accessible and very good quality database collected by the Uruguayan Tourism Board (MINTUR) to estimate our econometric models. The data used in this paper were collected between November 2009 and March 2010 by the Uruguayan Tourism Board. The sample of the survey consists of 3348 cruise passenger interviewed at Montevideo and Punta del Este. In the survey, information was requested about the tourists' socio-demographic characteristics, expenditure levels and satisfaction levels. The survey included the following items: infrastructure, quality of transportation, cleanliness and hygiene, safety, tranquility, prices, general satisfaction with the visit and amount of the expenditures in tours, shopping, transportation and food and beverages. The paper is organized as follows. The next section reviews the literature in models of cruise passengers' expenditure. Then we present an overview of the cruise industry in Uruguay and a description of the main characteristics of cruise passengers arriving in the two cruise ports of the country. In the subsequent sections we present a description

of the methodologies and the empirical results. Conclusions are summarized in the final section.

## **2. Research on cruise passenger's expenditure**

In the scientific literature there is a slow increasing of studies exploring the economic impact of cruise tourism on the communities. Kester (2003) sustains that main barrier for the analysis of economic impacts comes from the absence of data describing the economic behavior of the tourist. Indeed, with the current available data bases it is not an easy task to quantify and measure the direct, indirect and induced economic impact of the cruise industry to a particular destination. According to Dwyer and Forsyth (1998), four types of travel expenditures must be calculated to measure the economic significance of cruise tourism to ports and regions: (i) passenger-related expenditure; (ii) crew-related expenditure; (iii) vessel-related expenditure; and (iv) support expenditure. There are two type of research related to the travel expenditure. On the one hand there is work related to the evaluation of the economic impact of the travel expenditures, and on the other hand there is some research trying to understand the expenditure behavior of the passengers and how the expenditure is related to demographic or social characteristics of the tourists. This paper makes a contribution on this second type of studies.

As suggested by Braun et al. (2002), the economic impact of travel expenditures can be evaluated through models like the Travel Economic Impact Model developed by the research department at Travel Industry Association group or through regional input-output model. These types of evaluations has the difficulties that many cruise lines sail under flags of convenience and employ worldwide crews, making ambiguous the

indirect and induced effects of input-output models (see Brida and Zapata-Aguirre, 2010). Dwyer and Forsyth (1996) provided a framework to evaluate the economic impact of the Australian residents' expenditure in coastal cruise and international cruise. The authors mentioned that as Australian residents switch from a domestically based holiday to a cruise tourism holiday, less of their expenditure will be retained by Australian industry. By using input-output models, Chase and McKee (2003) found that cruise tourism did not have a significant economic impact on Jamaica while Gibson and Bentley (2006) show evidence of positive economic impacts of cruise tourism in the South West of England and no evidence of negative effects. Vina and Ford (1998) describes the regional economic impacts of cruises arriving to the Port of Corpus Christi, Texas, USA and compares the effects of being a port of embarkation as opposed to a port of call. Archer (1995) presents a discussion on the economic impact of cruise ship passengers on a base economy showing that the distinction between a port of call and a port of embarkation is critical. The evaluation of the cruise tourism impact has included environmental or social variables as well. Johnson (2002) characterizes the economic impacts of cruise tourism and provides economic measures of environmental impacts of cruises. Wilkinson (1999) found that, when the negative environmental and social impacts of cruise tourism are taken into account, the positive effect of cruise tourism is questioned. Bresson and Logossah (2011) present evidence of the crowding-out effects of the cruise tourism on the stay-over tourism (and the economic consequences of this fact) for fifteen Caribbean countries.

The significance of travel expenditure in relation to the different characteristics of tourists (demographic, economic, socio-cultural, etc.) is recognized in the modern

literature on tourism. Most work to date in this area has been based on a mixture of hypothetical and observational data, sample expenditure surveys and multipliers. Morrison et al. (2003) compares the expenditure behaviors of cruise passengers and land tourists, showing that cruise vacationers have a high tendency to buy all-inclusive package vacations, making the cruise industry very supportive of the travel agency community as its primary source of business growth. Brida and Risso (2010) estimate a cross-sectional regression model for the cruising expenditure, showing the existence of different profiles that are related to the expenditure levels. In particular, the study shows that heavy spenders are distinguishable from the other segments in terms of age, hours spent out of the ship, nationality, income levels and their spending pattern. Henthorne's (2000) study of factors influencing spending of cruise passengers shows that the perception of vendors being pleasant and non-aggressive was important in stimulating sales. Douglas and Douglas (2004) estimated the expenditure patterns of cruise ship passengers in seven Pacific island ports of call showing that passenger contribution is invaluable to Pacific island ports that have few exploitable resources other than their culture, their environment and their location. Seidl et al. (2006 and 2007) provide an overview of cruise tourism economics in Costa Rica, focusing on cruise passenger demographics, preferences and purchase behavior, and comparing cruise passengers with land tourists. They show that Costa Rica's cruise tourists are motivated by similar motives as are other tourists and tend to visit at the same time as the broader tourism industry peaks. They also show that these two segments of visitors differ in socioeconomic and demographic characteristics.

In a study of the port of Curacao, Miriela and Lennie (2010) show that the number of hours spent onshore, being employed, being repeated cruisers, being prior

informed about the port and having a high level of education are all factors that positively influence the future behavior of cruise visitors. Similarly, the findings for Azores (Silvestre et al., 2008) show that factors such as the city's attractions and the overall visit experience are the most important determinants of the intention to return and to recommend the islands to friends and relatives. In the case of Panama's cruise passengers, researchers were interested in identifying the travel preferences of passengers visiting an eco-tourism place (Thurau et al., 2007). In a more recent study, Andriotis and Agiomirgianakis, 2010 present the case of the port of Heraklion (Crete, Greece) with the objective to identify those factors associated to the cruise ship passengers' motivation, satisfaction and likelihood of return to the port. Hall and Braithwaite (1990) present an analysis in the Caribbean, which compared leakage from stopover visitors with cruise visitors, concluding that cruise passengers are more likely to spend on low leakage activities such as sightseeing and handicraft shopping. Some papers as Andriotis and Agiomirgianakis (2010), Cessford and Dingwall (1994), Qu and Ping, (1999), Polydoropolou and Litinas (2007), Duman and Mattila (2005), Petrick (2005), Petrick and Sirakaya (2004), Gabe et al. (2006), Marti (1992), Lois et al. (2001), Teye and Leclerc (1998) and Moscardo et al. (1996) among others, explore cruise tourists economic behavior by segmentation of the market and studying motivation, probability of returning to a cruise destination and satisfaction.

### **3. Recent developments in the cruise tourism in Uruguay**

During the last 7 years, the cruise tourism industry in Uruguay has dramatically increased its importance. With a boost in the 2005/06 season<sup>1</sup>, as shown in Table 1 with

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<sup>1</sup>In Uruguay summer goes from December to March and the cruise season goes from November to April.



32% more cruises arrived than in the previous season, the inter-annual average growth rate of arrived cruises over the last five summer seasons is 20%. The ports where Uruguay receives cruise ships are two: the capital city Montevideo and the resort town Punta Del Este. An important difference between both destinations is that while in Montevideo passengers disembark directly in the port of call, in Punta del Este the ship remains away from the shore and arrives to the coast by boat. When analyzing each of these destinations separately, we find that Punta Del Este has the largest average growth rate of arrived cruises with a figure of a 60% average growth over the last five seasons, whilst Montevideo only experience a rate of 6% average growth.

**Table 1: Arrived cruises per year and port**

Season	Montevideo	Punta del Este	TOTAL	Variation
2004/05	63	12	75	
2006/05	65	34	99	32%
2006/07	80	50	130	31%
2007/08	98	68	166	28%
2008/09	79	86	165	-1%
2009/10	83	96	179	8%

Source: Authors' calculations based on MINTUR information

More important than the number of cruises arrived though, is the number of passengers disembarked and their spending amounts. According to the official statistics, the proportion of disembarked arrived tourists for both Montevideo and Punta Del Este is slightly over 80%. This is in line with other cruise destinations. (see Brida et al., 2012c) Numbers regarding disembarked tourists show even a more important increase than the number of arrived cruises, as shown by Table 2. Overall, the average growth rate of the disembarked cruise tourists over the last five years is 43%, with Punta Del Este showing an important figure of 102% average growth rate and Montevideo 22%. According to

data provided by the Uruguayan Tourism Board, regarding the total and per capita spending amount over the last years, the total amount spent in Punta del Este grew at a rate of 92%, the figure for Montevideo is of 34% and the overall per capita growth rate was of 56% overall. On the other hand, the per capita spending grew on average 20% for Punta Del Este, Montevideo and the overall picture. In the 2009/10 season the total spending amount was US\$ 17.830.909, translating into US\$ 61 per capita (Risso, 2011).

**Table 2: Disembarked passengers per year and port**

	Montevideo	Punta del Este	TOTAL	Variation
2004/05	46.962	9.205	56.167	
2006/05	75.526	35.301	110.827	97%
2006/07	85.074	63.988	149.062	34%
2007/08	122.632	133.961	256.593	72%
2008/09	112.151	134.969	247.120	-4%
2009/10	112.790	179.258	292.048	18%

Source: Authors' calculations based on MINTUR information

It is important to state that the destination preferred by cruise passengers moved from one port to another in the last years. While in the 2004/05 season 84% of the passengers arrived to the port of Montevideo, the season of 2009/10 showed that 61% of the passengers arrived to the port of Punta Del Este, being the season of 2007/08 the turning point. With respect to the nationality and age profiles of the arrived tourists, as portrayed by Table 3, the 2009/10 data shows that the predominant nationality of the passengers is Brazilian. Also we find that the 61% of the disembarked tourists were between the ages of 30 to 64.

**Table 3: Passengers nationalities (Season 2009/10)**

Nationality	Total	Percentage
Brazil	154.061	52,80%
Argentina	68.328	23,40%
USA	35.546	12,20%
Europe	15.650	5,40%
Other Latin-American Countries	12.838	4,40%
Uruguay	356	0,10%
Other/Missing Data	5.269	1,80%
Total	292.048	100,00%

Source: Authors' calculations based on MINTUR information

#### 4. Methodology

The questionnaires include information on four expenditure categories. These categories are Food and Beverage, Tours, Transport and Shopping. Two models are applied for understanding the tourist expenditure. First, a probabilistic model is used to search for the best variables explaining the tourist decision of spending. Second, a censored data model is used for exploring the effects of the variables on the expenditures in each category. A censored model is used because there is a potential grouping of values for the dependent variable at zero value. In this case the Tobit model (Tobin, 1958) enables all the available information from the independent variable to be used incorporating both the decision to spend or not to spend, and the level of expenditure in a single model. Following Kim et al. (2010), it is assumed that the probability of spending in the categories Food and Beverage, Tours, Transport, and Shopping is independent of each other. Thus, the probability of spending in Tours is independent of the probability of spending in Food and Beverage and the decision of spending or not in the different categories can be treated as a binary decision<sup>2</sup>.

<sup>2</sup> The underlying assumption that stands behind the independency in the probability of spending in each category is that tourists have enough money to at least spend some positive amount in each category. The interdependency issue may arise if the tourist's disposable income is low enough that, for example, he or she has to decide whether to spend money on tours or shopping.

For each category we construct a binary variable that takes the value 1 if the tourist spent something in the category. Using this specification we use a Logit model to explore which characteristics of the visitor best explain the probability of spending or not in each category.

The binary logit model form is as follows (see Ben-Akiva and Lerman, 1993):

$$P(y_i = 1|x_i) = \frac{e^{x_i\beta^i}}{1 + e^{x_i\beta^i}}$$

where  $y_i = 1$  indicates expenditure in the category  $i$  greater than, and  $y_i = 0$  indicates that the expenditure in category  $i$  was zero. The vector of independent variables  $x_i$  is specified in Table 4 We will estimate the vector of parameters  $\beta^i$ .

**Table 4: Description of variables used in the regressions**

<b>Variable</b>	<b>Description</b>
visits	N° of times that the tourist visited Uruguay previously.
USA	Dummy variable. Takes the value 1 if the tourist resides in USA.
Br	Dummy variable. Takes the value 1 if the tourist resides in Brazil.
Ar	Dummy variable. Takes the value 1 if the tourist resides in Argentina.
crew	Dummy variable. Takes the value 1 if the interviewee is a crew member.
manager	Dummy variable. Takes the value 1 if the visitor's occupation is Manager.
professional	Dummy variable. Takes the value 1 if the visitor is a Professional.
employer	Dummy variable. Takes the value 1 if the visitor occupation is an Employer.
retired	Dummy variable. Takes the value 1 if the visitor is a Retired.
female	Dummy variable. Takes the value 1 if the visitor is a female.
port_Mvd	Dummy variable. Takes the value 1 if the visitor port of arrival is Montevideo.
18-29	Dummy variable. Takes the value 1 if the age of the visitor is between 18 and 29 years.
30-65	Dummy variable. Takes the value 1 if the age of the visitor is between 30 and 65 years.
65_	Dummy variable. Takes the value 1 if the visitor is older than 65 years.
group	N° of persons travelling with the visitor.
prices	Dummy variable. Takes the value 1 if the visitor declares to dislike the level of prices.
Punta_del_Este	Dummy variable. Takes the value 1 if the tourist visited Punta del Este.
Colonia	Dummy variable. Takes the value 1 if the tourist visited Colonia.
Mvd	Dummy variable. Takes the value 1 if the tourist visited Montevideo.

For each category we estimate a Tobit model also. Estimating the Tobit model we explore which characteristic of the tourist best explain the amount of spending in each category. The general formulation of the Tobit model is

$$y_i^* = x_i \beta^* + \varepsilon_i$$

$$y_i = 0 \quad \text{if } y_i^* = 0$$

$$y_i = 1 \quad \text{if } y_i^* > 0$$

where  $y_i^*$ , represents the expenditure made by the tourist  $i$  in a given category and the vector of independent variables  $x_i$  is the same specified in Table 4.

The vectors of parameters  $\beta^l$  and  $\beta^l$  in both models have different interpretations. In the logit model, the vector of parameters gives information about the probability of spending in a given category. In the Tobit model the parameters capture the sensitivity of an independent variable to the expenditure in a given category by the average tourist.

## 5. Results

### *Food and Beverage expenditure*

Almost 20% of the sampled visitors spent something in Food and Beverage. To analyze the expenditure in this category we present the regression results of both the Logit and Tobit model in Table 5. From the Logit model estimation we can conclude that the most likely visitor spending in Food and Beverage is a crew member resident in USA. This result is in line with the fact that the cruise passengers have their meals already included in their fee so their return to the ship to have lunch, whereas crew members have to buy their lunch and they usually disembark to find some place to do so. Near the ports of

Montevideo and Punta del Este there are bars and restaurants whose principal customers are crew members of cruises and other kind of ships. Besides, the size of the group the tourist is travelling with has a positive impact on the probability of expenditure within this category, as a visit to the city of Colonia also has<sup>3</sup>. The first result may indicate that when people travel in groups they are more likely to sit down and enjoy lunch therefore having a higher probability of spending in this category. The second result commented previously suggests that fine cuisine in Colonia attracts more cruise passengers to spend money in that category than in Montevideo or Punta del Este. The tourist less likely to spend something in Food and Beverage is a female between 30 and 65 years, whose occupational status is manager, employer or retired.

Looking at the statistical significance of the coefficients in the Tobit model we can conclude that the same tourist characteristics that improve or diminish the chances of spent something, are the ones which improve or diminish the amount of expenditure in the category. This is important as it shows robustness in the results. In both the Logit and Tobit model the variable *prices* has a positive impact, which to the reader might seem a peculiar result. Is worth noting that this variable does not represent the price of any product or service; is just a dummy variable representing the like or dislike of the visitor with the general level of prices in Uruguay, not with any particular expenditure category.

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<sup>3</sup> Colonia is a city that lies in the south-west of the Uruguayan shore, 180 km. away from Montevideo and 300 km away from Punta del Este. It is commonly visited by tourists because of its old city and its Spanish and Portuguese's roots.

**Table 5: Food & Beverage expenditure**

	<b>Food &amp; beverage expenditure</b>	
	<b>Logit Model<sup>+</sup></b>	<b>Tobit Model<sup>++</sup></b>
visits	-0.005 (0.031)	-0.029 (0.082)
USA	0.346* (0.194)	1.014* (0.549)
Br	-0.004 (0.016)	-0.018 (0.05)
Ar	-0.034 (0.033)	-0.127 (0.099)
crew	1.027*** (0.178)	2.752*** (0.511)
manager	-1.095* (0.586)	-2.822* (1.64)
professional	-0.237 (0.151)	-0.669 (0.415)
employer	-0.322* (0.18)	-0.839* (0.509)
retired	-0.790*** (0.303)	-2.296*** (0.816)
female	-0.391*** (0.065)	-1.152*** (0.175)
port_Mvd	0.137 (0.295)	0.667 (0.885)
30-65	-0.249* (0.142)	-0.677* (0.373)
65_	-0.038 (0.246)	-0.124 (0.629)
group	0.216*** (0.042)	0.696*** (0.118)
prices	0.254* (0.138)	0.736* (0.397)
Punta_del_Este	0.039 (0.483)	0.289 (1.344)
Colonia	0.738* (0.412)	1.890* (1.113)
Mvd	-0.011 (0.216)	-0.133 (0.609)
constant	-1.296*** (0.419)	-4.190*** (1.168)
Log likelihood	-1577.9402	-3018.4729
Prob>Chi2	0.000	0.000
Censored observations	-	2686
Uncensored observations	-	662
Observations	3348	3348

+ The dependent variable is a dummy that takes the value 1 if the visitor has positive spending in Food and Beverage and 0 otherwise.

++ The dependent variable is the logarithm of the amount spent by the visitor in Food and Beverage, in US\$ dollars.

Standard errors in parentheses. Significant at 10% \*, 5% \*\*, 1% \*\*\*



*Tour Expenditure*

Looking the regression results of the Logit model in Table 6, we can appreciate that the cruise passengers visiting Montevideo and Punta del Este are likely to hire tour services, but not the ones visiting Colonia. This could be caused by the fact that Colonia is a small town where sightseeing can be made traveling by foot or also renting golf carts. As expected, the less likely visitor spending in a Tour is a crew member, and the number of previous visits has a negative impact on the probability of spending in this category. Besides, the Brazilian residents are the less likely to spend in a Tour.

**Table 6: Tour Expenditure**

	<b>Tour expenditure</b>	
	<b>Logit Model<sup>+</sup></b>	<b>Tobit Model<sup>++</sup></b>
Visits	-0.171** (0.077)	-0.570** (0.258)
USA	-0.188 (0.288)	-0.658 (1.042)
Br	-0.035** (0.017)	-0.133** (0.063)
Ar	-0.029 (0.045)	-0.125 (0.167)
Crew	-2.187*** (0.662)	-7.169*** (1.896)
manager	-0.508 (0.729)	-1.982 (2.589)
professional	-0.229 (0.145)	-0.966* (0.565)
employer	-0.409 (0.254)	-1.608* (0.909)
Retired	-0.236 (0.321)	-1.005 (1.146)
female	-0.213 (0.14)	-0.773 (0.499)
port_Mvd	-0.475 (0.389)	-1.824 (1.605)
18-29	-1.27 (1.304)	-4.422 (5.024)
30-65	-0.755 (1.174)	-2.399 (4.577)
65_	-0.834 (1.237)	-2.663 (4.779)
Group	0.078 (0.054)	0.347* (0.206)
Prices	-0.839*** (0.24)	-3.019*** (0.786)
Punta_del_Este	0.797*** (0.284)	2.864*** (1.097)
Colonia	0.838 (0.633)	3.261 (2.387)
Mvd	0.768*** (0.241)	2.841*** (0.995)
constant	-1.668 (1.212)	-8.156* (4.793)

<b>Tour expenditure</b>		
	<b>Logit Model<sup>+</sup></b>	<b>Tobit Model<sup>++</sup></b>
Log likelihood	-803.8546	-1333.1138
Prob>Chi2	0.000	0.000
Pseudo R <sup>2</sup>	0.0406	0.0253
Censored observations	-	3118
Uncensored observations	-	230
Observations	3348	3348

+ The dependent variable is a dummy that takes the value 1 if the visitor has positive spending in Tour and 0 otherwise.

++ The dependent variable is the logarithm of the amount spent by the visitor Tour, in US\$ dollars.

Standard errors in parentheses. Significant at 10% \*, 5% \*\*, 1% \*\*\*

Comparing the Tobit with the Logit model in Table 6, we can see that the significant coefficients are the same and have the same sign in both models. Therefore, the same visitor characteristics that increase or decrease the chances of spent something, are the ones which increase or decrease the amount of expenditure in the category.

#### *Transport expenditure*

Looking to the Logit model in Table 7 we can conclude that the most likely visitors spending something in Transport are those younger than 30, who travel in a large group and disembark in Uruguay at the Port of Montevideo. USA residents are found less likely to spend in this category.

In line with the Logit model, in the Tobit model in Table 7 we find that the type of visitor who spends more in Transport is a non-USA resident who travels with a large group and disembark in Uruguay at the Port of Montevideo.

**Table 7: Transport expenditure**

	<b>Transport Expenditure</b>	
	<b>Logit Model<sup>+</sup></b>	<b>Tobit Model<sup>++</sup></b>
Visits	-0.05 (0.074)	-0.104 (0.215)
USA	-1.230** (0.485)	-3.727*** (1.382)
Br	-0.017 (0.016)	-0.048 (0.055)
Ar	-0.034 (0.037)	-0.118 (0.119)
Crew	0.165 (0.568)	0.495 (1.805)
Manager	1.084 (0.66)	3.345 (2.289)
professional	-0.001 (0.465)	-0.042 (1.417)
Employer	0.342 (0.406)	1.117 (1.253)
Retired	-0.4 (0.484)	-1.187 (1.493)
female	-0.037 (0.211)	-0.104 (0.627)
port_Mvd	1.597*** (0.337)	5.839*** (1.294)
30-65	10.429*** (0.719)	-0.463 (1.137)
65_	10.742*** (0.879)	0.565 (1.625)
Group	0.242*** (0.09)	0.839*** (0.315)
Prices	-0.097 (0.386)	-0.321 (1.241)
Punta_del_Este	0.292 (0.966)	1.012 (3.084)
Mvd	-0.94 (0.806)	-3.726 (2.41)
Constant	-14.913*** (0.951)	-17.567*** (3.126)
Log likelihood	-354.84663	-518.25742
Prob>Chi2	0.000	0.000
Censored observations	-	3271
Uncensored observations	-	77
Observations	3348	3348

+ The dependent variable is a dummy that takes the value 1 if the visitor has positive spending in Transport and 0 otherwise.

++ The dependent variable is the logarithm of the amount spent by the visitor in Transport, in US\$ dollars.

Standard errors in parentheses. Significant at 10% \*, 5% \*\*, 1% \*\*\*

### *Shopping expenditure*

Looking at the Logit model in Table 8 we can appreciate that members of the crew and people who dislike the prices are less likely to have positive spending in this category.

Looking at the significant coefficients of the Tobit model in Table 8 we see that the visitors with lower expenditures in Shopping are the Argentinean residents and crew members that dislike the prices. The visitors with larger expenditures are the ones who visit Montevideo.

**Table 8: Shopping expenditure**

	<b>Shopping Expenditure</b>	
	<b>Logit Model<sup>+</sup></b>	<b>Tobit Model<sup>++</sup></b>
Visits	0.005 (0.033)	0.018 (0.095)
USA	0.031 (0.16)	0.077 (0.471)
Br	0.009 (0.008)	0.027 (0.025)
Ar	-0.028 (0.021)	-0.111* (0.062)
Crew	-0.654*** (0.21)	-2.081*** (0.635)
Manager	0.261 (0.514)	1.138 (1.464)
professional	-0.157 (0.126)	-0.424 (0.38)
Employer	-0.181 (0.151)	-0.411 (0.417)
Retired	-0.174 (0.151)	-0.547 (0.435)
female	0.064 (0.089)	0.147 (0.271)
port_Mvd	0.113 (0.343)	0.12 (0.973)
30-65	-0.191 (0.653)	-0.175 (0.457)
65_	-0.12 (0.607)	0.007 (0.527)
Group	-0.021 (0.026)	0.01 (0.079)
Prices	-0.295* (0.174)	-1.001* (0.53)

<b>Shopping Expenditure</b>		
	<b>Logit Model<sup>+</sup></b>	<b>Tobit Model<sup>++</sup></b>
Punta_del_Este	0.09 (0.24)	0.443 (0.676)
Mvd	0.254 (0.233)	1.066* (0.628)
Constant	-0.569 (0.785)	-2.139** (0.947)
Log likelihood	-2095.5034	-4671.6818
Prob>Chi2	0.000	0.000
Censored observations	-	2234
Uncensored observations	-	1114
Observations	3348	3348

+ The dependent variable is a dummy that takes the value 1 if the visitor has positive spending in Shopping and 0 otherwise.

++ The dependent variable is the logarithm of the amount spent by the visitor in Shopping, in US\$ dollars.

Standard errors in parentheses. Significant at 10% \*, 5% \*\*, 1% \*\*\*

### *Total expenditure*

In Table 9 we present the regression results of a Logit and a Tobit model to analyze the total expenditure made by each visitor.

The Logit model suggests that the most likely visitor to spend something is a crew member, a professional or an employer. The visitor group size and visiting Punta del Este are characteristics of the tourist that improves the chances of spending something.

From the results of the Tobit model we can conclude that the visitor profile which tends to spend more is a non-Argentinean resident male whose occupational status is professional.

**Table 9: Total Expenditure**

	Total expenditure	
	Logit Model <sup>+</sup>	Tobit Model <sup>++</sup>
Visits	-0.03 (0.029)	-0.026 (0.029)
USA	-0.196 (0.272)	-0.140 (0.157)
Br	-0.007 (0.022)	-0.005 (0.007)
Ar	-0.061 (0.037)	-0.098*** (0.016)
Crew	0.616*** (0.179)	-0.208 (0.184)
manager	0.422 (0.593)	0.211 (0.392)
professional	0.600*** (0.121)	0.298*** (0.094)
employer	0.351** (0.153)	-0.087 (2.168)
Retired	-0.183 (0.155)	-0.367*** (0.132)
female	-0.151 (0.095)	-0.179** (0.080)
port_Mvd	1.051* (0.604)	0.458 (0.318)
18-29	0.688 (0.794)	2.329** (1.030)
30-65	1.126 (0.788)	2.749*** (1.023)
65_	1.233 (0.824)	2.798*** (1.030)
Group	0.242*** (0.054)	0.328*** (0.035)
Prices	-0.291* (0.149)	-0.472*** (0.135)
Punta_del_Este	0.770** (0.364)	0.620** (0.283)
Colonia	0.609 (0.951)	0.359 (0.417)
Mvd	0.062 (0.393)	0.285 (0.236)
constant	-0.72 (1.138)	-0.064 (-1.069)
Log likelihood	-1413.94	-6788.6432
Prob>Chi2	0.000	0.000
Pseudo R <sup>2</sup>	0.0483	0.0246
Censored observations	-	546
Uncensored observations	-	2802
Observations	3348	3348

+ The dependent variable is a dummy that takes the value 1 if the visitor has positive spending in any category and 0 otherwise.

++ The dependent variable is the logarithm of the total amount spent by the visitor, in US\$ dollars. Standard errors in parentheses. Significant at 10% \*, 5% \*\*, 1% \*\*\*

### *Independent variables*

Until now we have analyzed the regression results of each model. In Table 10 we analyze the same models but in a slightly different manner.

Listed in Table 10 columns are the independent variables used in the Logit and Tobit models of each expenditure category. Each Table 10 row corresponds to one of these models. In each cell of Table 10 is presented the statistically significant coefficient sign of the correspondent model and independent variable. If the coefficient was not statistically significant the cell is empty.

Table 10 is an appropriate way to visualize the importance of each of the tourist characteristics. From Table 10 we can conclude that the visitor group size is a crucial determinant in the visitor spending decisions. The visits the tourists made to different cities within the country is also an important determinant of expenditure, as reflected in the positive coefficients of Montevideo, Punta del Este and Colonia. However, the previous visits a visitor made to Uruguay have a negative impact on their spending decisions.

**Table 10: Significance of variables.**

<b>Expenditure</b>	<b>Model</b>	<b>visits</b>	<b>USA</b>	<b>Br</b>	<b>Ar</b>	<b>crew</b>	<b>manager</b>
Total	Logit					+	
	Tobit				-		
Food & beverage	Logit		+			+	-
	Tobit		+			+	-
Tour	Logit	-		-		-	
	Tobit	-		-		-	
Transport	Logit		-				
	Tobit		-				
Shopping	Logit					-	
	Tobit					-	

  

<b>Expenditure</b>	<b>Model</b>	<b>professional</b>	<b>employer</b>	<b>retired</b>	<b>female</b>	<b>port_Mvd</b>	<b>18-29</b>
Total	Logit	+	+			+	
	Tobit	+	+	-	-		+
Food & beverage	Logit		-	-	-		
	Tobit		-	-	-		
Tour	Logit						
	Tobit	-	-				
Transport	Logit					+	+
	Tobit					+	
Shopping	Logit						
	Tobit						

## 6. Conclusions

This study considered the cruise passengers' expenditure in Uruguay as a key variable in the economic analysis of the cost and benefits associated with the cruise industry. The importance of detecting the variables affecting the expenditure is important in order to improve the impact in the Uruguayan economy. The latter could be done by



designing policies in order to promote the positive variables and discouraging the negative aspect. The result of the empirical exercise allows the estimation of the average expenditure for typical cruise passengers arriving to Uruguay and makes possible to forecast the changes made in the tourist expenditure when any of the significant characteristics change and also helps to provide an insight of the passengers' likelihood of spending in different categories depending on a set of socio-demographic variables.

In this regard, we find that crew members are more likely to spend in the food and beverages category, because cruise passengers have their meals already included in their fee. From a policy making point of view, a solution for this would be for local restaurants to make deals with the cruise companies or offering free degustation of traditional Uruguayan cuisine so that the visitors don't have to return to the ship for lunch. Also people travelling in bigger groups are heavier spenders in this category than people travelling alone or in couples. In the tour expenditure category we find that people visiting Punta del Este and Montevideo are more likely to hire tour services, while Brazilian people are less likely to spend money in this category. With respect to the expenditure in transportation, we find that people less than 30 years old who disembarked in Montevideo has a bigger probability of having a positive expenditure in this category, while USA nationals have a lower one. In the shopping expenditure category, we see that the dislike of the price level reduces the likelihood and the average spending, we also find that Argentinians have lower spending than passengers from other nationalities. This is mainly caused by the trend of the last 3 years of Uruguayan Peso appreciation against the Argentinean currency in the domestic currency market.

Overall, we find that cruise tourism in Uruguay is a dynamic sector of the tourism industry and because of its increasing importance it should be the focus of more studies

in order to improve managerial and policy making decisions associated with this sector. Based on our results some steps towards a better exploitation of cruise tourism in Uruguay can be suggested. Given that group size is a powerful variable explaining individual expenditure behavior, entrepreneurs and policy makers should advertise Uruguay as a destination with facilities to group activities, such as entertainment and cultural events. In a similar vein, the cruise tourism sector should promote Uruguay as a destination instead of a particular Uruguayan port of call. The city variables in our estimations have a significant explanatory power of the tourist expenditure behavior. This suggests that would be beneficial to the Uruguayan economy if a significant portion of the tourists who disembark visit more than one city. A fairly similar result has been found in a study of the cruise tourism in Cartagena de Indias, Colombia (Brida et al, 2012a), where is concluded that the time spent onshore is crucial to the expenditure behavior.

We should also mention that we believe that cruise tourism in Punta del Este could grow if a cruise ship port was built, but a formal study of this statement requires a cost-benefit analysis that is beyond the scope of this paper.

Future research might include the application of the techniques of this study to other periods of time in the same destination and/or to other cruise destinations included in the same cruise routes of Montevideo and Punta del Este so that results can be compared. Also, it would be interesting to include some other important variables in the questioner as the educational background of the passenger, their income level, and time spent outside the cruise ship. The study demonstrated the advantage of using two different techniques. In the future, this research could be extended by comparing other statistical techniques such as the Heckman model or some semi-parametric approaches.

Finally, another important topic for future research can include the comparisons of the expenditure characteristics of cruisers and land tourists.

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