

A note on the contribution of Valuation economics in tourism

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Abstract

Valuation economics is a field which promises a wide range of applications for tourism. However, the new born nature of tourism economics has not yet unveiled the vast opportunities for tourist policy information and the pricing information embedded therein. This paper aims to briefly conceptualize these opportunities with examples on the methods and relevant examples of literature and pave the way towards their accommodation in the emerging tourism economics field. Market failure occurrences in tourism drive the need for total economic value estimation for a wide array of tourist goods through the employment of stated preference techniques and revealed preference techniques. Tourism can also benefit from the benefit transfer approach initially conceptualized in environmental economics which have contributed to a great development and expansion of these methods.

Key words: Stated preference techniques, tourism economics, revealed preference techniques, valuation, value transfer

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Introduction

Tourism economics is an emerging field which needs the strengthening of its theoretical foundations (Vanhove, 2018; Tribe, 2016). Therefore, tourism economics could benefit greatly from theory loans and examples from other economic disciplines that have performed for longer times in the stage of economic theory. One such field is the valuation economics which has played a very important role in environmental economics, public economics and other fields of economic and social life seething with striking examples of market failure. Foremost, a plethora of interactions of tourism with the natural environment unfold a wide range of tourist-environmental goods suffering from the lack of sufficient and clear property rights. This entails that tourist-environmental goods suffer from wrong defined prices, which not only give consumers the wrong signals about their economic and social importance, but at the same time, tourist businesses forego the information for their customers' consumer surplus and a fair mark-up for their businesses, thus rendering themselves less competitive and sustainable. At the same time, policy makers forego useful information that would enable them a cost-benefit analysis of fiscal policies such as tourist taxes and subsidies for related businesses and infrastructure.

Nowadays tourism has been referred into environmental policy agendas as one dimension integrated into the environmental policy. Agenda 21 (WHO, 1997) and post Kyoto agreements such as the Doha Amendment and the Paris Agreement (UN, 2015) adopt such an attitude. Thus, while environmental legislation in the USA requires after the guidelines of NOAA (National Oceanic and Atmospheric Administration) panel, the employment of economic valuation methods for the estimation of environmental problems and damages (Korol & Spyridou, 2020; Randall, 1997), this is not the case for tourism and its interactions, which are regarded as a special case of environmental affairs. Environmental valuation has received particular focus after the Exxon Valdez oil spill, a notorious case of environmental damage which inaugurated the usage of valuation economics as a necessary tool in public economics or environmental economics and public decision making in the USA and other countries.

This short paper aims to constitute a brief and educative conceptual overview of the necessity to adopt valuation economics tools in modern tourism economics given the likelihood of underpriced tourism goods available that need a more all-inclusive pricing to be implemented that will guarantee a sustainable future not only to the involved entrepreneurs, but also to all stakeholders, namely local societies and future generations.

After this introduction (Part 1), the paper starts with an account of property rights and market failure in the tourism sector (Part 2). Part 3 provides a complete overview of all the interconnections of tourism with environment, Part 4 provides a simplified presentation of the methods for tourism valuation, Part 5 offers a Discussion with Implications and Part 6 concludes the paper.

Property rights and market failure in tourism

Tourism resources can be owned by individuals, governments or organizations and other institutions. Due to the fact that tourism is a comprehensive product and thus defined by a multitude of geographical, cultural, environmental, climatic and anthropogenic parameters, this comprehensive nature is also transferred to the concept of tourist resources. Tourism property rights are theoretical constructs in economics that determine who owns the tourist resources, who has the right to use the tourism goods, earn income from them, bequeath them to his/her descendants and appeal to legal measures enforcement when these resources are illegally used or trespassed (Hardin, 1968; Bromley, 1991; 1992). When the tourism good is a hotel or a tourism related business, there is no doubt that it belongs to its owner and shareholders. However, the unavoidable interaction of tourism with the

natural and social environment in which it functions, inserts environment, ambient elements and society in the base of the comprehensive good perceived as a tourism product and thus injects all the long inherited problems of market failure of the environmental economics (Tietenberg and Lewis, 2018; Fotiadis, Nuryyev, Achyldurdyeva, & Spyridou, 2019), into the more recent field of tourism economics (Havitz and Adkins, 2002).

With the term market failure in economics, we define a situation in which the allocation of goods is not efficient, because of externalities, information asymmetries, monopolistic structures, principal-agent problems (Coase, 1960). Thus, the claimed owners of the goods for which markets fail, pursue self-interested goals and reap individual profits at the expense of the society or at the expense of the more justified owner. For example, while the hotel belongs to its private owner, the beach on which the hotel is built, is regarded as a social good, to which everybody has the right of access and enjoyment. The “tragedy of the commons” is a term coined by William Forster Land in 1833 to describe a hypothetical example of unregulated grazing in common land. This concept was destined to stay as classic in environmental and ecological economics literature and used to describe the expropriation of public goods by individual users for the pursuit of their own motives and interests at the expense of the interests of the rest of potential users, namely the society.

Since tourism interacts with the environment and society, we can safely claim that in tourism there are numerous un-priced goods, because the environment itself encompasses numerous un-priced goods. A few examples of them could be: traffic congestion from tourism (Wie & Choy, 1993), noise pollution from tourism, landscape alienation from tourist activities and infrastructure, overcrowding in cities hosting many tourists, the price of cultural monuments, natural parks, beaches, local resources such as water and energy, environmental pollution contributed by tourists and many others. Prices for these goods could ensure that the goods are not underpriced or free ridden and that the polluter pays for his polluting actions. Prices that are informed of the real value enjoyed by the user of the goods (consumer surplus), will render tourism businesses more competitive and this will allow justice and fair compensation to local communities which are sometimes both benefited and harmed by tourism.

Nowadays, the tourism industry becomes continuously aware of the environmental friendly solutions it should adopt in order to avoid damaging the environment and also render itself a profitable business, both because it saves money through environmental efficient solutions, but also because it renders itself a legitimate business, since the environmental legislation becomes a lot more sophisticated with time and requires from businesses the adoption of expensive technologies whose cost should be carefully incorporated in tourist goods prices. For example, hotels use special tap sensors for water conservation or they use magnetic cards for turning off the electricity in the hotel room when the tourist is not there. These technologies, while they bring direct water and electricity savings to the hotelier and their investment costs are gradually depreciated in the conventional accounting way, at the same time the hotel sells its customers the good of environmental quality and of resources conservation. This has a value for the customer which increases his/her consumer surplus, from which the producer or the state might have a share. The producer can provide more informed prices and the policy maker more informed tax and subsidy structures.

Use and non-use values from tourism

Total economic value consists of the use value and the non-use value (Bateman and Langford, 1997). The use value is derived from the direct or indirect use of a good, while the non-use value stems from non-using the good but from the satisfaction of knowing that it exists (exist value) and it is there for one to bequeath it to the next generation (bequest value) or from knowing that no harm has happened

to the good because one may be sentimentally connected with the good and wants it stay intact and in good condition (option value). The “exist value” and the “bequest values” are motivated from altruism and an attitude of kindness towards the good. There are additional sub-configurations, sometimes with other names, in different authors, but the main difference is as aforementioned and is demonstrated in Figure 1.

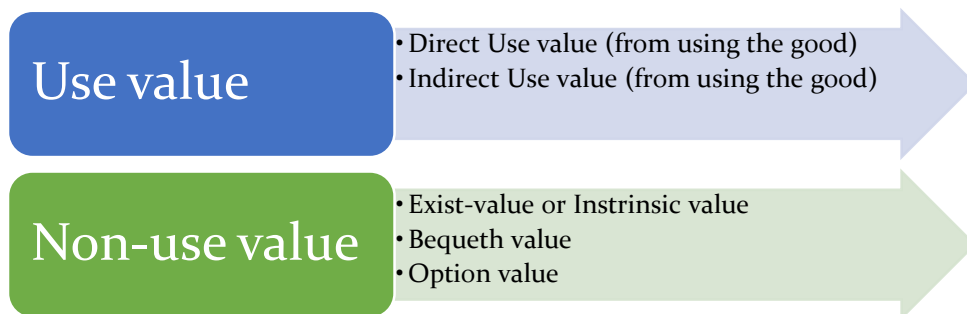


Figure 1. Typology of the value of the tourist good.

Adapted from: Bateman and Langford (1997)

Since these concepts are derived from environmental and resource economics and this is the first attempt to show their conceptual counterparts in tourism, the interested reader is advised to refer to Hanley and Spash (1994); Bryan and Minter (2003); Cummings *et al.*, (1986). There are infinite examples of non-use values in tourism. To return to the aforementioned example of the water and energy saving hotel, the non-use value from these actions might be perceived by tourists as very high. This non-use value will be derived from a hotel which does not squander natural resources and thus the customer feels that he/she has done the right thing towards the environment, the so-called warm glow effect. The customer feels the moral obligation to praise the hotelier who has worked for improving the environment and he does that by selecting a hotel that hosts environmental friendly practices. Furthermore, this is a feeling of altruism that one’s leisure enjoyment and entertainment does take occur at the expense of water and energy resources, namely at the expense of the environment. By valuing high an environmental friendly hotel, resources are preserved and the water cycle is not perturbed with all the negative consequences, namely water is not deprived from locals and fossil energy resources are not overexploited at the expense of the resource quantity available for the next generation. Foremost, energy conservation will reduce the contribution to greenhouse gas and the climate change and locals will not be left with electricity black outs for the benefit of undisturbed tourist resort electrification. All this, is an eloquent example of what motivates and constitutes the non-use value of a tourist product.

The consumer surplus in tourism

The knowledge of the total value of the tourist good can lead to a more accurate knowledge of the consumer surplus, and consequently to a more accurate pricing that reflects the shadow price of the tourist-environmental good. This information can be helpful for policy making (e.g. tax and subsidy designs) and the tourist businesses for a more informed pricing mark-up and marketing strategies design. Figure 2 depicts the demand and supply curves and the consumer and producer surplus for a hypothetical tourist good. The vertical axis hosts the price of the tourist good and the horizontal axis hosts the quantity of the tourist good. The consumer surplus is the triangular area ABP^* . The producer surplus is the triangular area P^*BC .

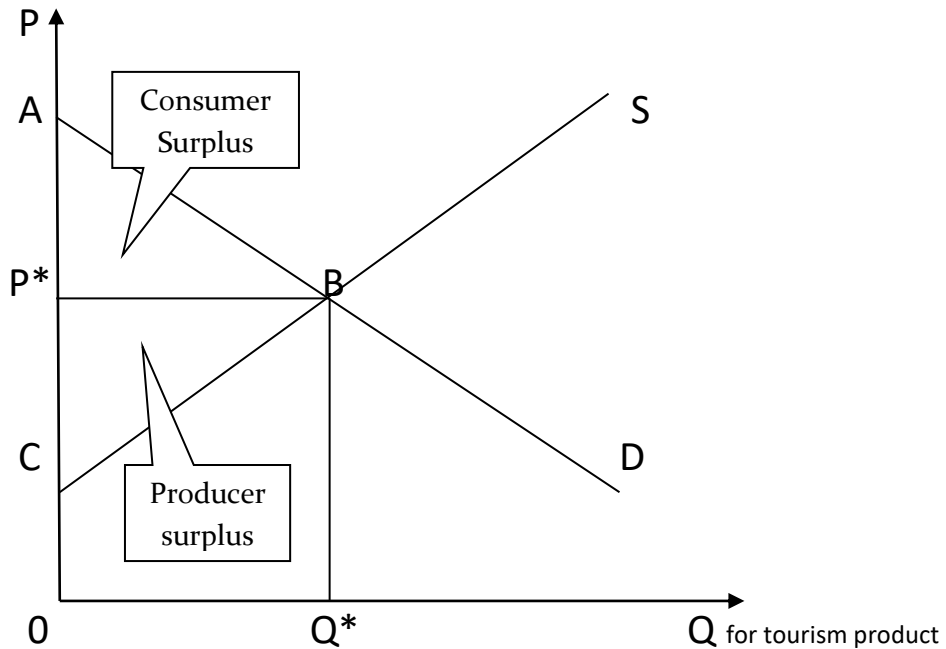


Figure 2. The consumer and producer surpluses in tourism

The consumer surplus (triangular area ABP^*) is an approximation of the WTP/WTA (Willingness to Pay/ Willingness to Accept) measures we will describe next in section 4.3 in this paper. Assuming that Willig conditions hold, WTP and WTA are equal to each other and the consumer surplus. The consumer surplus is a good approximation of the WTP if the income elasticity of demand is very small or zero (Efthymoglou & Xepapadeas, 1990).

Empirical literature does not confirm the equality of WTP with WTA and offers five basic explanations for this divergence: i) The reference-dependent preferences; Consumers' preferences are a function of an initial endowment which affects their substitution between goods (Tversky & Kahneman, 1991), ii) The transaction costs paid for the replacement of a lost item (Randall & Stoll, 1980), iii) The auction design used in the surveys. If the bidder is unsure of the value of the good, the bid will move downwards relative to the true WTP (Kolstad & Guzman, 1999), iv) The uncertainty, irreversibility and limited learning opportunities which entail commitment costs (Zhao & Kling, 2001), v) The substitution effect between other market goods and the good under valuation (Hanemann, 1999). Overall, the knowledge of consumer surplus allows the accurate pricing of the tourist good and an informed fiscal policy.

At this point, we would like to make a note about the fact that the valuation methods on which the current paper focuses, are micro-economics oriented and their major pursuit is the discovery and the calculation of the consumer surplus. They are not macro-oriented and therefore the establishment of cointegration or causality relationships (Lathiras and Siriopoulos, 1998; Gang *et al.*, 2005) are beyond the scope of this paper and hence not examined.

Interactions of tourism with environment, society and the economy

Interactions of tourism with the environment

Tourism interacts with the natural environment in many ways (Saayman, Krugell, & Saayman, 2016). Foremost, what makes tourism an attractive and unique experience, is the natural environment wherein it takes place. The physical place, the landscapes, the flora and fauna, the forests (Bostedt & Mattsson, 1995) the wildlife, the biodiversity, the natural resources, the weather and the climatic conditions all contribute to the overall experience called tourist good. Next, this section will explain in brief the interactions of tourism with all facets which compose the environment.

- ✓ **Landscape:** Tourism infrastructure, tourism businesses and actions, are closely dependent on the landscape. The landscape can attract tourists to enjoy it and businessmen to build tourist units in it. Both the visiting activity and the building activity can cause negative impacts on landscape. A hotel that is built in a coast area or a forest area can change the landscape permanently.
- ✓ **Air:** Air is polluted from greenhouse gas emissions. Tourist transport is a major emitter and is higher than the emissions caused by built infrastructure (European Commission, 2001). Aviation and long-haul travelling are blamed for releasing huge amounts of CO² emissions which are responsible for ozone destruction and climate change with all the known negative consequences; Temperature increase, precipitation change patterns, the alteration of seasons, the occurrence of extreme weather events such as floods and droughts and the increase of sea water level which will afflict island tourism and coasted tourist areas.
- ✓ **Water resources:** Tourism is a major consumer of water resources and this causes a tremendous problem in arid tourist areas. In such areas tourists, the local population and the local industries compete for the already shortaged water resources. Increased demand for water in hotels for sanitary purposes, drinking, swimming pool fillings, irrigation of hotel gardens and sports facilities contribute to the over extraction of underground fresh water. On top of that, the increased consumption of food puts additional pressure on water resources through agriculture. Increased pumping of water causes emptying of the underground aquifers and contributes to the generation of the phenomenon of desertification in which the cultivated land transforms into permanent desert.
- ✓ **Energy:** Besides water, tourism puts a lot of pressure to the energy balance and energy security of a country. Increased consumption of fossil energy sources leads to their gradual extinction, together with the emission of greenhouse gases and their aforementioned contribution to climate change. The penetration of renewable and clean energies has significant sunk costs and sometimes does not gain social acceptance, due to the impacts they may cause on landscape and biodiversity. For example, sometimes the construction of wind parks may face public opposition, because of the aesthetic affect they have on landscape or the fact that birds can be killed in their rotors. Moreover, photovoltaic panels can have negative impacts for the soil they cover and sacrifice permanently and due to the reflection they cause because of the sun, as well as the aesthetic effects they cause to landscape.
- ✓ **Ecosystems and biodiversity:** Mass tourism can aggravate ecosystems and disturb biodiversity. Mass visits to natural destinations beyond their capacity can cause permanent damages to ecosystems and biodiversity.
- ✓ **Agriculture:** Increased tourist numbers are accompanied by increased pressure for food and agricultural products. The increased consumption of meat food entails increased emissions of methane, another greenhouse gas, which is produced from the digestive system of cows. Intensive farming and cultivation degrades the soil quality and leads to excessive consumption of water and energy. Importing food from foreign markets entails transport emissions. Tourist areas also suffer from increased prices in basic agricultural products due to high demand.

- ✓ **Solid waste:** The tourist sector causes sizeable production volumes of waste corresponding to the sector's consumption. Wastewater from tourism is either treated in individual wastewater treatment plants which are constructed in big hotels outside urban places, or it ends up and it is treated in the municipal wastewater treatment plants, thus contributing to higher operation and maintenance costs. Similar consequences with increased costs are applicable when solid waste is disposed in landfills or it is recycled.
- ✓ **Pollution:** Contamination and the subsequent pollution takes place in various ways. Besides littering which occurs in all possible places (in the sea water, river and lakes, beaches, air etc.), pollution takes place through the excessive emissions of greenhouse gases which go beyond the environmental assimilative capacity. Once again, the temperature increase of the sea water causes the imbalance of sea flora and fauna and the occurrence of the eutrophication problem which deprives the fish of the necessary oxygen to stay alive. Last, the plastic littering in seas ends up in the organism of fish and through the food chain, reaches the humans.

While all the aforementioned effects would have taken place even without the presence of tourism, these problems become more intense with the presence of tourism and drive a tourist place beyond its bio capacity limits in as short time and in a more dramatic way.

Interactions of tourism with society

Besides its interactions with the natural environment, tourism also generates social and cultural interactions (Canziani, 2016; Lindberg & Johnson, 1997). Through tourism, people exchange traditions, ideas and language knowledge. In places which constitute popular tourist destinations, local residents are more open, extrovert and tolerant to other cultures, beliefs and religions. On the other hand, together with these positive elements, tourism also brings negative effects and can downgrade local communities through the advent of harmful habits such as heavy drinking or drug addiction and the reckless way of living exhibited by some tourists while they are on holiday, e.g. reckless driving, criminality etc.

Tourism also brings forth new consumption types, new food tastes, clothing and entertainment forms. Also, it can propagate different lifestyles and family patterns which are pertinent in urban life, e.g. divorced couples and new family patterns.

Last, mass tourism affects and disrupts the natural serenity of a place and causes congestion, crowding and noise. The lives of local residents may be disrupted on a continuous base from the inbound tourists. Sometimes, locals move house and change jobs in order to adapt to the new social and economic reality imposed by the advent of mass tourism.

Interactions of tourism with the economy

Tourism is regarded as a form of service exports and thus it improves the balance of payments in a country. The improvement in the exchange rate between the domestic and the foreign countries deteriorates the term of trade between the domestic and the foreign countries, because exports become more expensive. The increase in tourism revenue also increases competition for imported goods between tourism and the other industries of the domestic economy.

The tourist sector brings changes in the structure of the economy wherein it operates. Most factors of production are absorbed by tourism. Wages are increased due to high demand for labour in tourism, thus depriving the rest of the industries with cheap working force. Traditional economic sectors are neglected and abandoned for the sake of tourism.

Infrastructure that is developed for tourism, due to tourism, or by tourism (e.g. ports, airports, motorways), is also available to the rest of the sectors and institutions in an economy. Tourist activity has direct, indirect and induced effects in an economy. Besides the direct effects reaped by tourist industries through their revenues, there are also indirect effects for the industries that cater for the supplies of tourist industries. Last, another source of revenue for a tourist economy originates from taxes.

To calculate the effects of tourism in an economy, tools such as an input-output table analysis together with a social accounting matrix or a computable general equilibrium model can be very insightful in measuring the net benefits of tourism in an economy.

Tourism goods and tourism-caused damages that need valuation

Given the interactions of tourism with the natural environment and the society as well as the economy, it is understood that while the interactions with the economy can be measured with the calculation of tourism multipliers, the interactions with the environment and the society encompass values that have not been measured yet. This can be implemented with economic valuation methods which are presented in section 4 of this paper.

Examples of tourist goods that need valuation are landscapes and natural parks, beaches, rivers and lakes, archaeological and cultural heritage sites etc. Moreover, tourism activity causes damages whose size needs to be estimated in pecuniary terms as well: pollution size calculation and its abatement measures, the reduction of natural resources with respect to tourist usages, the valuation of traffic congestion caused by tourism and noise pollution as well as the valuation of all environmental and social costs related to tourism.

The economic valuation methods for tourism

This section will briefly explain the main economic valuation methods that can be used for the estimation of the total value of a tourist product. These methods are commonly used in environmental and public economics. They consist in stated and revealed preference methods. Conjoint analysis is very similar to the choice experiment method which is a stated preference method, but it does not have a utility theory foundation. Other methods such as multi-criteria analysis belong to managerial methods and not economic ones. Thus, they are not examined in this paper. Last, this section presents the benefit transfer possibilities available in tourism valuation surveys.

Stated preference techniques in tourism

Stated preference methods are distinguished from the revealed ones, because they are relying on a value and a preference that is stated by the consumer. Both of them are survey-based economic techniques. The consumer states his/her idea and size of total value through a carefully designed framework which is typically a survey (through personal interviews, telephone interviews, mail interviews or web surveys (Menegaki, Olsen, & Tsagarakis, 2016)). Methods falling under the stated preference category are the contingent valuation method and the choice experiment method.

The Contingent Valuation Method (CVM) in tourism

The contingent valuation method (CVM) has earned its name by the fact that consumers state a value upon a hypothetical (contingent) context. The method estimates the value of the tourist goods for which markets do not exist. The hypothetical market context constructs a tourist good in the most realistic way. Consumers are asked to state their Willingness to Pay (WTP) to buy a tourist good or how

much they are willing to accept (WTA) in order to forego the utility from the consumption of the tourist good. Since the method relies on intended buying behaviour and not a realized one, the method is criticized for a number of biases it may suffer from.

One of the most serious criticisms against CVM is that WTP does not take into account the individual budget constraints and respondents in CVM surveys may not be able to afford the amount they are WTP. This is not necessarily a problem, since the method derives the economic value of the good based on its shadow price and not necessarily on the consumer's ability to pay for that. The results of the CVM should be used in conjunction with information from various stakeholders forming focus groups. Citizen juries (Aldred & Jacobs, 2000) consisting of a sample of citizens who meet at regular interval times to consider an important policy question are recommended as the conclusive stage of a CVM. The citizen jury meets at the end of the survey and research while the focus group meets at the beginning of the research. Citizen juries are a means to understand the way one constructs one's values.

The CVM surveys contain either open-ended or closed ended questions (dichotomous and polychotomous choice questions or iterative bidding and bidding cards). All types of elicitation formats ideally and normatively should provide the same results. The result equivalence is termed as convergent validity. However, open-ended questions have been found to produce lower WTP responses (Markowska & Zylicz, 1999), because the consumer is deprived of a yardstick with which one could realize how to answer. Also, the dichotomous choice questions require a larger number of responses to identify the underlying distribution of the valued good (Costa & Santos, 2016).

The bid curve for tourist i is defined as shown in Equation (1):

$$WTP(i) = f(Y(i), E(i), A(i), Z(i), T, U(i), e(i)) \quad (1)$$

With Y: income, E: education level, A: age of tourist, T: tourism good quality, Z: other variables, U: individual use of the tourism product e: a random disturbance.

To provide a more tangible perception of the WTP, suppose that WTP is a continuous variable, namely it is derived from a direct question of the type: 'How much would you be willing to pay for the X tourism good?' This response can be accompanied by basic descriptive measure such as the mean, range, standard deviation etc., and fundamentally with its 95% confidence interval which can be produced as in Equation (2):

$$\mu \pm 1,96 \times \frac{\sigma}{\sqrt{n}} \quad (2)$$

With σ denoting the standard deviation, n the sample size and μ denoting the mean of the WTP. This is one vital component in a typical WTP study. Afterwards, the relationship of WTP is studied in conjunction with various demographics or other characteristics of consumers-tourists or businesses.

Thus the WTP model assumes the following form in Equation (3):

$$WTP_i = a + b_1X_1 + b_nX_n + \varepsilon_i \quad (3)$$

Is a constant that absorbs various other parameters that have not been included in the model, the betas are the coefficients for each parameter assumed to affect and determine the WTP and X stands for the

parameter that affects WTP, may that be a demographic element or other. If logarithmic transformation is imposed on both sides of the equation 3 and for the continuous variables, this can generate elasticities of the right-hand side equation magnitudes with respect to WTP. This is a strategy followed by many researchers.

The range of tourism goods, which can be offered for valuation, can be vast. Some up-to date examples are: Studies by Madison and Foster (2001), Beltran and Rojas (1996) and Sharifi-Tehrani *et al.*, (2013) value the congestion at the British Museum the Mexican archaeological sites and the National Museum of Iran respectively. The study by Madison and Foster (2001) underlines the possibility of museum value becoming diminished through visitor congestion and reflects on the policy of free access to the museum which could dissipate the benefits of a visit. The study has resulted into that congestion imposed a marginal cost equal to 8.05 British pounds. The study by Beltran and Rojas (1996) have used the CVM to estimate willingness to pay for consumption and preservation of the archaeological zones in order to estimate individual willingness to pay for the consumption and preservation of archaeological sites and they elaborate on various price discrimination strategies that could get the complete consumer surplus. Last, the study by Sharifi-Tehrani *et al.*, (2013) estimates the willingness to pay of visitors for the National Museum of Iran and correlates this willingness to pay with various socio-economic, geographical and psychological characteristics. Foreign and domestic tourists have been found to be different in many of those characteristics. For example, foreign visitors have a higher willingness to pay and this could lend insights for a dual pay system between foreign and domestic tourists.

Yeh *et al.*, (2018) explore the economic non- use value of the natural landscape for sport tourism in Taiwan, while the use value is estimated with a travel cost method. Dharmaratne *et al.* (2000), value protected areas and Ji *et al.*, (2018) compare the WTP between locals and tourists in the Grand Canal (world heritage site), China. Baral *et al.*, (2017) also estimate the value of Mount Everest National Park, Nepal. Dribek and Voltaire (2017) estimate the value of beach erosion in Tunisia. Anna and Saputra (2017) estimated the value of fishing activities and the habitats in a national park in Indonesia, while they employ the Travel Cost (TC) method to calculate the costs incurred by local and international tourists.

The Choice Experiment (CE) method in tourism

Another stated preference method is the Choice Experiment (CE), which is very similar to conjoint analysis. The former has its foundations in utility theory, while the latter is a purely mathematical method. The CE method deals with the valuation of characteristics and attributes of the tourist good, rather than the total value of the tourist good.

The theoretical foundations of CE originate from Thurston (1927) and Lancaster's consumer theory (Lancaster, 1966). According to it, consumers derive utility from the characteristics or attributes of a good. Profiles containing combinations of attributes and their levels assembled in choice sets are presented to consumers for their selection among others. The CE method breaks down total WTP into smaller components. Each component corresponds to a specific attribute and level of attribute. The CE method is based on the random utility model whereby not all factors affecting choice are observable. This is shown in Equation (4):

$$U_{ij} = V_{ij} + e_{ij} \tag{4}$$

Where U_{ij} is the consumer's utility i for choice j , V_{ij} is the observable part of utility of the consumer i for alternative j and e_{ij} is the random component of utility. V_{ij} is modeled as a function of the attributes of the choice and the individual characteristics of the person who makes the choice. Given the fact that the utility cannot be observed, choice modelling entails specifying the probabilities of selecting a given choice alternative from a set. The basic choice model assumes that error term is an extreme value type I distribution as shown in Equation (5).

$$P(e_{ij} \leq t) = F(t) = \exp(-\exp[-t]) \quad (5)$$

This error term specification leads to the well-known multinomial logit model in Equation (6):

$$P(\text{tourist } i \text{ chooses } g) = P(U_{ig} > U_{ih}) = \frac{\exp(\mu V_{ig})}{\sum_j \exp(\mu V_{ij})} \quad (6)$$

With μ being the scale parameter, while the sum is over all alternatives offered to the tourism for a given valuation situation (Bateman et al., 2002) The model is estimated with maximum likelihood with the log likelihood for a sample of N tourists facing J alternatives being provided in Equation (7):

$$\log L = \sum_{i=1}^N \sum_{j=1}^J y_{ij} \log \left[\frac{\exp(\mu V_{ij})}{\sum_{l=1}^J \exp(\mu V_{il})} \right] \quad (7)$$

Where y_{ij} is an indicator variable taking value 1 if the tourist chooses alternative j and the scale parameter is normalized to 1 for the multinomial logit model. The latter implies that variances across alternatives are equal.

The econometric model consists of a set of utility functions equations 3-5, with Equation (8) representing the first level of the decision made by the consumer. This decision depends on demographics and attitudinal factors respectively (z vector in Equation 3, x vector in Equations 9 and 10 contain the attributes of the tourist good). ASCs (Alternative Specific Constants) stand for the status quo, the impacts of unobserved attributes and the residual effects from the error term:

$$U(\text{status quo}) = ASC_0 + \beta'z + \varepsilon, \quad (8)$$

$$U(\text{choice A}) = a'x_A + \varepsilon_A, \quad (9)$$

$$U(\text{choice B}) = a'x_B + \varepsilon_B \quad (10)$$

The variety of tourist topics on which CE are applied can be vast. Some examples are: Kim (2018) uses a CE to examine tourist preferences for the change in the quality of rural tourism resources in Korea. Bujosa et al., (2018) analyze tourist preferences with respect to global warming, Aanesen et al., (2018) value coastal recreation and visual intrusion from tourist activities in Norway, Walters et al., (2018) value the threat of tourism in tourist choices, Koo et al., (2017) value international air access on the demand for peripheral tourism destinations from Korea to Australia, Kim & Park (2017) value the attributes of a hotel, Karlsson et al. (2017) value BnB and many other studies contain CE on various aspects of traveling and tourism. Particularly, the study by Bujosa et al., (2018) employs a choice experiment on tourists in Mallorca, Spain to elicit preferences for policies for the restoration of natural attractiveness affected by global warming. In this context it measures willingness to pay for various environmental policies and introduces uncertainty due to the stochastic nature of global warming. According to their main findings, the inclusion of uncertainty describing the scenario, shapes the choice

made. The subjects of the study have been found to be more likely to opt for an improving alternative under scenarios where both the expected temperature change and the probability occurrence are higher. The study by Aanesen *et al.*, (2018) use a choice experiment implemented in Norway which reveals the trade-offs made by local households between commercial and recreational activities. Households have a high willingness to pay for new job creation and thus they give advantage to commercial activities despite the visual intrusion they create but on the condition that strict regulation is made to reduce debris and littering.

One of the most important virtues in choice experiments is the capability of the model setup to disentangle WTP values for each attribute and characteristic of the product from the total WTP value. These are the so-called part-worths. They can be estimated from Equation 11:

$$WTP = -I \times \left(\frac{b_X}{b_{price}} \right), \quad (11)$$

Where I is 1 for more than two levels of the attribute and 2 for two level attribute

Conjoint analysis for tourism marketing

Conjoint analysis is mostly used for applied marketing and bears a strong resemblance to choice experiments, but the utility foundation applies only in the latter. Louviere *et al.*, (2010) state that conjoint analysis is inconsistent with economic demand theory, and is subject to some logical inconsistencies which an applied economist should have in mind before employing this method for policy and welfare valuations. Conjoint analysis emerged from Conjoint Measurement which is a mathematical method dealing with the behaviour of number systems. Thus, it has no roots in the utility theory which is concerned with the behaviour of humans and their human preferences. Nevertheless, the number of studies using conjoint analysis is still large. Verma and Chandra (2018) and Wehrli *et al.*, (2017) study the effects of the sustainability measures on hotel customers and how these should be communicated to customers. Pai and Ananthakumar (2017) use conjoint analysis to explain tourist preferences for travel packages and many other studies employ conjoint analysis on a variety of tourism topics.

Revealed preference techniques in tourism

Conversely to stated preference methods, the revealed preference methods are relied on choice behaviour that is revealed under a real market framework and a real market transaction. Two methods are falling under this category, namely the hedonic pricing and the travel cost method.

The Hedonic Pricing (HP) method in tourism

The hedonic pricing (HP) method is most commonly used in the housing market. The price of a building or land depends on the characteristics of the building or land (e.g. size, appearance, age, special etc.), and the characteristics of the environment (e.g. accessibility of property to school, hospital, supermarket and other facilities, level of air pollution, level of noise pollution etc.). The price function of the property is shown in Equation (12):

$$P = f \left(\vec{s}, \vec{n}, \vec{e} \right) \quad (12)$$

With $\vec{s} = (s_1, s_2, s_3, \dots)$, the characteristics of building or land, $\vec{n} = (n_1, n_2, n_3, \dots)$, the characteristics of the locality, $\vec{e} = (e_1, e_2, e_3, \dots)$, the environmental characteristics around the building or land.

More specifically a stochastic regression in a hedonic pricing model can take the form in Equation (13):

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + u \quad (13)$$

where y is the dependent variable and the X s the independent ones. There are many approaches that can be followed for the estimation of such models and the interested reader can refer to Owusu-Ansah (2011).

The variety of tourist topics on which HP are applied can be vast. Some examples are: Thinh *et al.*, (2018) use the HP to value beach erosion by tourism in a world heritage site in Vietnam, Latinopoulos (2018) value the effect of sea view on hotels. More specifically, the study by Thinh *et al.*, (2018) has used hedonic pricing to evaluate the damage of the beach erosion and tourism relationship. The beach value appears as a function of morphological variables such as width, coastal businesses, hotel and room number. They employ a two stage least squares and they estimate losses to be around 29million US\$ by 2040 with present values of the total revenue loss to be about 29.6, 21.4 and 14 million US\$ in 2020, 2030 and 2040 with an interest rate equal to 5%. The study by Latinopoulos (2018) has used a sample of 557 rooms in Halkidiki, Greece based on GIS system integration and he applies a spatial hedonic model. The results from this study indicate that spatial variability on the effect of sea view to room rates and local natural and or tourism resources have a substantial role in aesthetic values. Other examples of studies are Espinet-Rius *et al.*, (2018) who value cruise tourism, Hernández (2016) who study the interrelationship between rural and mass tourism, Tsai *et al.*, (2016) study the impact of tourism resources on tourism real estate value, Wang *et al.*, (2016) investigate the effect of a coastal park's attributes on its entrance fees and many other studies on a variety of tourist property prices on relation to the characteristics of property, community and environment. Espinet-Rius *et al.* (2018) use HP to value cruise tourism and Fonner and Berrens (2014) to value lift tickets for US alpine ski areas and the effect of congestion.

The Travel Cost Method (TCM) in tourism

The travel cost method (TCM) estimates a demand curve where the quantity is provided by the number of trips to a destination and the price is the travel cost paid in the form of gas, petrol, toll fees, entree fees, depreciation of the car cost, cost of the trip time corresponding to the opportunity cost of the work time. The consumer surplus (CS) is estimated based on Equation (14):

$$CS = \int_{p^0}^{p^C} x(\cdot) dC = \left[\frac{e^{\beta_0 + \beta_1 C}}{\beta_1} \right]_{C=C^0}^{C \rightarrow \infty} = -\frac{x}{\beta_1} \quad (14)$$

C is the price of the trip, β_1 is the coefficient of C .

There is a variety of tourist topics on which TCM can be applied. Some examples are: Yeh *et al.*, (2018) explore the economic use value of the natural landscape for sport tourism in Taiwan. Haider *et al.*, (2018) value the recreational services provided by tourist spots in Bangladesh. They also use a CVM to estimate WTP for developing these sites. More specifically, the study by Haider *et al.*, (2018) use TCM and CVM to estimate the recreational values of those spots and the willingness to pay for the development of those sites. he results show that these spots generate consumer surplus worth 1.24–3.64USD per tourist per annum and thus, yield gross recreational value worth 0.06–0.84 million USD per year to tourist population of this region. Each tourist is willing to pay 0.06–0.10USD on an average to develop the quality of recreational services of these spots which accumulate 0.002–0.029 million USD annually. Veisten *et al.*, (2012) value nature and national parks in Norway.

Basically the TCM assumes two main forms: The individual one where the visitors ending to a certain destination, have incurred different costs, based on the distance they have covered and the number of visits they make. These elements help revealing a different demand curve. Other parameters are also important such as income, price and preferences. The price does not only concern a ticket cost, but various other costs incurred while travelling. The other form of travel cost is the zonal travel cost in which we use the number of trips to a place relative to the population of a certain zone. This version of the method presupposes the establishment of zones from which travellers come, as concentric rings around a recreation spot or a destination. To save space, the stochastic form of the travel cost equation is similar to the one shown in the CVM and the rest of the methods. The dependent variable is the number of trips while in the independent variable position one can find variables that relevant to the constituents of travel cost.

Benefit and cost transfers in tourism

When time or funds for a research topic does not suffice for the launching of a tailor-made survey, benefit transfer (or cost transfer) methods can provide a valid, reliable, albeit second-best, solution. The essence of benefit transfer concept is that the valuation researcher can look for a pre-existing similar study or studies and adopt the WTP/WTA results for his/her new study. For example, if two countries have similar economic, social and environmental conditions, it is highly probable that valuation results can be transferable from one country to the other. Also, various hypothesis or adaptations (scaling) can also take place when one transfers benefits or costs from one occasion to the other.

The two most common benefit transfer methods are the unit value transfer and the benefit function transfer (Johnston, Rolfe, Rosenberger, & Brouwer, 2015). The former can take place with the transfer of a number or a set of numbers from pre-existing valuation studies and it may be adjusted for the level of prices, differences in income and other economic parameters pertinent in each occasion. On the other hand, a function transfer involves either information from a single estimated function or a synthesis from two or more estimated functions or a meta-analytic synthesis which comprises information from a larger sample of studies. Hedonic pricing data concerning tourist properties are expected to be more easily transferable because more hotel parameters can be measured and compared across properties in an objective way. The same applies with travel cost transfers to natural or archaeological sites where the object of valuation is more concretely defined and preferences are calibrated through their revelation.

Discussion, Implications and Policy making

The current study acquaints tourism economists with the essentials and the background of valuation economics and its methods for the full pricing of public goods in tourism. This conceptual paper provides a quick update on stated and revealed preference techniques that are used to calculate the consumer surplus from the consumption of a tourism good. Besides the externalities that are caused during tourism production and consumption, tourism interacts with the natural environment in order to offer its final product. Given that the natural environment is still mostly an open access resource, namely with loose if any property rights, this generates the necessity of consulting valuation economics in order to address market failures in tourism. Undoubtedly tourism cannot exist without its natural environment. The natural environment has suffered many cases of mismanagement and degradation, not only due to tourism but also due to most other human activity. Following modern trends in sustainable development and international agreements, these cases of mismanagement, injustice and degradation can be corrected with prices and policy making (taxes and subsidies). The stated and the revealed preference techniques the paper describes have been implemented in various cases in tourism

and we refer to those examples together with some of their major findings. However, and therein lies the uniqueness of this paper is that never before has this knowledge been gathered together with parallels drawn for tourism. The paper describes all the common interface of tourism with the environment and society and this presentation gives a good explanation of the wide spectrum on which this approach and valuation techniques can be applied.

Although valuation is not a compulsory by law ingredient for policy making, it is the unique road towards a sound cost-benefit analysis that is highly recommended for an informed policy making. Stated and revealed preference techniques can give a voice to tourists in a timely manner to express their preferences.

Concluding remarks

Tourism offers a comprehensive good because it is an experience generated from the interaction of geography, culture, relaxation, sightseeing, food and many other parameters. Thus, tourism has many interactions with environment, society and economics which have not been explored and valued. This is so because tourism economics is a new field of economics and thus there is a lower application of valuation economics tools therein so far. Nevertheless, the scope for valuation economics in tourism is enormous and is generated from the need to estimate values for non-priced or under-priced goods and subsequently the prices for tourist products (hotel room prices, entrance fees to national parks, travel ticket prices, food prices, water and energy prices, tourist taxes and subsidies etc.). This paper explains the use and non-use value concept in the tourist framework and reviews the valuation methods with examples from the up-to date literature. The paper is useful for tourist researchers who would like to use the valuation methods borrowed from valuation economics and become acquainted with their aims, objectives, pitfalls and solutions in a single, comprehensive overview. This is a unique conceptual paper that draws parallels for the first time from the valuation economics approach and valuation techniques, directly to tourism. While tourism literature has offered application on these methods, none of these studies does that connection and transfer in a conceptual way.

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