Analysing the effect of taxation on consumer behaviour in the tourism industry

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Abstract

This research explores the impact of tourism taxes on tourist behaviour. Research to date has tended to focus on the impact of tourism taxes on consumer behaviour only in terms of willingness to pay and the nature of the demand curve (Seetaram et al. 2018). Also, the impact of air passenger duties on outbound tourism has been assessed (Seetaram et al. 2014). However, these studies present different arguments for or against the use of tourism taxes, hence, the need to investigate more thoroughly the link between tourist expenditure and tourism taxation at both micro and macroeconomic levels cannot be overemphasized. This thesis argues that, at the household level in the European Union (EU), the impact of tourism taxes on household decision to spend on domestic tourism is different across regions within the EU. Additionally, specific socio-demographic features of the household moderate the impact of tourism taxes.

One of the elements of the household budget is expenditure on tourism and the research uses household budget survey data from The European Commission Statistics Division, together with further statistics on macroeconomic variables from the World Bank Development Indicator, to evaluate participation and spending of households across EU member states. Households are divided within the EU, with key conditional variables based on the Heckman model, with the decision to participate and spend on domestic tourism. The analysis is conducted on the full sample and disaggregated into different EU macro-regions. For the macroeconomic analysis, this research argues that tourism tax negatively affects international tourist arrivals. The Fully Modified OLS technique is used on data from 1996 to 2017 on determinants of tourism demand, tourism tax, and international tourist arrivals from 20 top source markets which makes up to 81% of total arrivals to the Maldives. Data are collected from the World Bank, UNWTO, and the Ministry of Tourism in the Maldives to evaluate the study objectives. The choice of the Maldives is motivated by the lack of sufficient studies on small Island economies. Thus, given the availability of tourism tax data and it has been a small Island economy dependent on tourism, it becomes imperative to test the impact of tourism taxes on the Maldivian economy.

The results indicate that higher tax rates on tourism services may dissuade tourists from participating in domestic tourism services, although higher tourism tax corresponds to higher household spending on tourism in the second stage. Also, for households above the median income with children and households with female head, the positive direct impact of tourism tax becomes negative which suggests that these categories of tourists respond negatively to an increase in tourism tax. However, single household heads decrease domestic tourism spending as tourism tax rises. Additionally, a higher tourism tax constrains tourists to pay for the expanded costs by diminishing the share of total household budget allocated to domestic tourism in a subsequent holiday. The findings show that a high tourism tax can discourage households from participating in domestic tourism activities, although those who do participate may spend more as tourism tax rises. However, when households are classified into certain sociodemographic groups, higher tourism tax leads to lower domestic tourism spending.

A sum of the macroeconomic impact of tourism taxation in small Island economies dependent on tourism shows that amending tax policies by increasing existing rates or introducing new ones had negative influences on five tourist source markets (China, the UK, Italy, Russia, and France), which accounts for up to 44% of the total international tourist arrivals to the Maldives. This implies that, for destinations dependent on tourism, tax policy has a direct effect on the volume of international tourist arrivals. Also, in absolute terms, inbound tourism demand in the Maldives is inelastic for changes in the tourism tax revenue. However, the magnitude and sensitivity to the level of tourism tax elasticity vary across source markets. Inbound tourists from 10 source markets, which accounts for 22% of the total arrivals, seem prepared to pay more for the most part and disregard the broader impact of tourism tax.

The findings from both streams of the analysis show that tourism taxes have had a detrimental effect on tourist spending on tourism, which, allied to the need by the government for additional revenue sources adversely affect the tourism industry. Consequently, tourism marketers should diversify market base and focus more on targeted marketing strategies. In addition, Island destinations should reduce overreliance on markets with homogenous features.

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Chapter One. Introduction

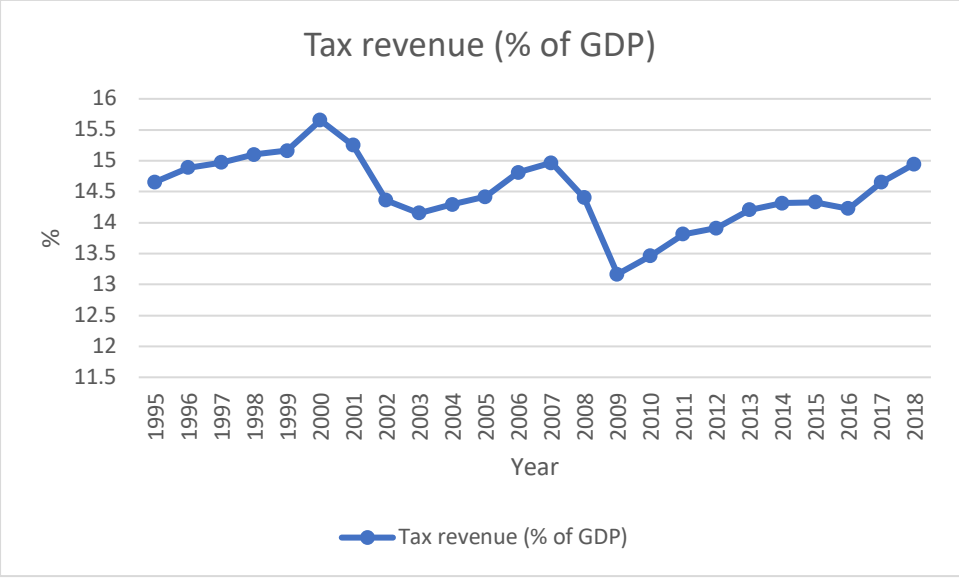
1.1. Background

Tourism entails all the activities of visitors (or tourists) outside their usual environment, and which is for a period not more than a year. Also, since the demand for tourism requires an equivalent supply of tourism services, activities of industries such as transport, hotel, restaurant, and other travel services extensively contribute to GDP through capital investments and government spending (Blake 2000, Wanhill 2006, Holzner 2011, Ihalanayake 2012, Pablo-Romero and Molina 2013, Antonakakis et al. 2015, Shahzad et al. 2017, Li et al. 2018, Sokhanvar et al. 2018). The tourism industry also provides jobs within travel and tourism. Since international tourists spend within the country, inbound tourism expenditure forms part of visitor exports.

As a result, tourism receipt is an important source of revenue in some countries, and the government spend to develop and sustain the tourism sector. This includes spending on cultural services and national parks or preservation of natural sites. Tourism also contributes to economic growth, and according to Antonakakis et al. (2015), although, tourism-led growth is unstable over time and depends on several event-based economic cycles, yet, the government can spend to upgrade the sector and boost the economy (Jucan and Jucan 2013). With increasing awareness, however, Forsyth and Dwyer (2002) concluded that the position of tourism industries in the global market attracts heavy taxes and makes their revenue dwindle and uncertain.

Taxes are obligatory contributions to the government for public service provision and is levied based on approved local, national, or international tax laws. Revenue from taxes is mostly used to provide public services. An analysis of data on world average in figure 1.1 shows that tax revenue as a percentage of total GDP has continually increased, since its decline after the global financial crisis of 2007 and 2008. According to the World Bank (2017), taxes on income, profits and capital gains, goods and services and trade-related taxes sum up to 60% of total tax revenue, and these increased continuously since the global financial crisis (figure 1). Given this trend, taxes form an important source of finance to the government.

Figure 1.1. World Tax revenue as a percentage of GDP and Share of various taxes in total tax revenue



Source: Author. Data source: World Bank's Database (2020)

The use and impact of taxes vary differently among economic agents. In addition to revenue generation, the government may use taxes to discourage imports and consumption of harmful products, redistribute income, protect the environment and infant industries, and sometimes correct for an adverse balance of payments conditions (Leicester et al. 2012). Furthermore, depending on the elasticity of demand and supply, and nature of the product, consumers behave differently from firms to minimize welfare losses from tax. Considering the nature of the tax, degree of market concentration and product differentiation, firms may seek to transfer the cost of the tax as a pass-through to prices, especially in imperfect markets (Fish 1982, Häckner and Herzing 2016). The incidence of the tax i.e., who bears tax burden between the producer and the consumer and in what proportion also depends on the demand and supply elasticity of the product. Additionally, contingent on whether the country is small or large, foreign products may become less attractive to local consumers, while domestic products may also become less competitive in the international market.

The taxation of tourism is a controversial and topical issue. Tourism is a key industry used by developing countries to generate income, employment, foreign exchange, and tax revenues (Mak, 2006). On one hand, tourism needs to use goods and services produced by different sectors highly inter-related among them as

agriculture (i.e., food and beverages), manufacturing (i.e., handicraft and souvenirs in general), and services (i.e., transportation and communication). On the other hand, the production of tourism goods and services require the use of resources that may have to be diverted from other economic uses (Mak, 2006). This inevitably imposes extra costs on governments that need to provide and maintain the necessary tourism infrastructure to sustain the economic benefits from the industry. These costs are often covered by residents through revenue generated from taxes.

In the European Union, tourism-related taxes have attracted significant attention due to its impact on the competitiveness of destinations in the union. With a high value-added tax of 27% and a low of 0% on tourism-related products (European Commission 2020), members of the union differ in the rates they use for attracting tourists to destinations. There are also specific tourism taxes such as occupancy and environmental or green tax which are earmarked for specific purposes and charged directly on the tourism industry. Government and local authorities of tourist destinations mostly argue that these taxes are meant to promote tourism development, improve the image of the destination, protect the environment or create funds to sustain the industry and resource recovery.

Similarly, with developing the travel industry, destinations that depend on tourism such as the Maldives have consistently increased tourism taxes. This includes bed tax of US$6 charged from all tourist-accommodating establishments for every night spent by a tourist as well as earnings received from Goods and Service Tax from the Tourism Sector (T-GST), the newly introduced Green Tax, Tourism Land Rent and Lease Period Extension Fee. The resort lease rent formula was again revised in 2011 from a bed capacity-based rent to a land-based rent, where US$8 is charged per square meter of the island. The T-GST, which was introduced in 2010 at a rate of 3.5%, was also increased to 6% from the 1st of January 2012, and subsequently, from the 1st of January 2013, it was again increased to 8%. From the 1st of November 2014, the rate was further increased to 12%. Whilst the tourism bed night tax was abolished from the 1st of December 2014, Green Tax was introduced on the 1st of November 2015.

Given the foregoing, the impact of these tourism taxes has been an ongoing debate in the literature. For example, while tourism taxes are said to place the burden upon the ones responsible for generating the costs, another argument in favour of tourism

taxation is that it can be used as a measure to correct for negative externalities such as pollution (using carbon tax or air passenger duties). Therefore, the net benefit obtained in a country by the tourism industry depends on how suitable and well-designed the tax system for the tourism sector is (Bird 1992, Mak 2006). Bonham et al. (1992), Bonham and Gangnes (1996), Blake (2000), Gooroochurn and Sinclair (2003b, 2005), and Gooroochurn (2004) have also argued in favour of tourism taxes. However, as governments introduce new tax systems and reform the structure of existing ones to target tourists, some authors argue against these taxes on the basis that they affect the national economy by slowing down growth rates and reducing the potential for creating and sustaining employment (Wanhill 1995, Jensen and Wanhill 2002, Durbarry 2008, Manente and Zanette 2010, Dwyer, Forsyth, and Spurr 2012, Seetaram et al. 2014, Arguea and Hawkins 2015).

Interestingly, some authors find a mixed impact of tourism taxes and recommend neither an increase nor a decrease. According to Sinclair et al. (2005), small island economies suffer from inefficiency and a trade-off between tourism and other sectors. Hence, policy options are limited and must be chosen carefully, given that tourism is the driver of such economies. Furthermore, in the case of tourism-dependent countries, a convenient and arguably efficient way to generate revenue is to impose tourism taxes, given its diverse effects on tourism exports, domestic tourism, and other sectors in the economy (Gooroochurn and Milner 2005). Other mixed effects of the impact of tourism taxes also emerge from the literature. Ihalanayake and Divisekera (2006) noted the importance of price elasticities in comprehending the demand and supply effects of passenger movement charge, visa charges and aircraft noise levy. Furthermore, the mixed impact of tourism taxes on the economy can also be due to market power of the destination (Sheng and Tsui 2009), or due to the share of tourism demand component of a commodity consumed by both domestic residents and tourists (Gooroochurn 2009). It is also important to note that the impact of tax on tourism goods and services also depends on the incidence of tax. This relates to whether the demand (tourists) or the supply side (tourism service providers) bears the burden of tax and to what extent. An important consideration for this is the nature of the demand and supply of the product or service been taxed and the market structure.

Several studies have been carried out on the macroeconomic impacts of tourism taxes. Some of the studies focus on the impact of tourism tax on the demand for tourism (Durbarry and Sinclair, 2001; Gooroochurn, 2004; Aguiló, 2005; Durbarry, 2008). Other studies find that tourism tax has either negative and positive effects on the welfare of citizens depending on the amount of the tax burden borne by visitors (Gooroochurn & Sinclair, 2005; Shenga and Tsuib,2009; Dwyer et al, 2004; Gago et al., 2009). On the other hand, only a few studies have investigated the microeconomic impacts. For instance, several authors have analyzed the impact of tourism taxes on welfare (Ihalanayake 2012, Song et al. 2012, Forsyth et al. 2014, Ponjan and Thirawat 2016, Mahadevan et al. 2017, Meng and Pham 2017, Zhang and Zhang 2018). Inferences have also been drawn on the impact of tourism taxes on consumer behaviour in terms of willingness to pay and the nature of the demand curve (Seetaram et al. 2018) as well as its impact on tourist arrivals and aggregate tourist expenditure (Aguiló, Riera, et al. 2005, Seetaram et al. 2014).

Given the various arguments on the impact of tourism taxes, this study uses two case studies; firstly, domestic tourism in the EU for the impact of tourism taxation on consumer behaviour which is yet to be investigated thoroughly; and secondly for international tourist arrivals and the impact of taxes for the case of small island economies using the Maldives as a case study.

1.2. Research Question and Philosophy

This research is focused on the microeconomic and macroeconomic impact of tourism taxes. Tourism has for long been recognized as an important source of economic development and the effect of tourism taxes on the consumer implies the wealth-creating potential of the tourism industry. For high earners such as countries in Europe on one hand, and highly dependent economies such as the Maldives on the other, it becomes vital to critically examine tourism tax impact on tourism spending and international arrivals respectively. Notable studies on tourism taxation have focused on the aggregate economic impact of environmental, accommodation, and value-added taxes on tourism services. However, this research aims to extend these analyses to access impact on consumer behaviour.

The findings of this research stimulate a better understanding of the different tax systems and types of taxes and their relative efficiencies which assists in the formulation, implementation and evaluation of fiscal policies at destinations;

advance our knowledge and understanding of consumer behaviour in tourism; infer on the efficacy of tourism taxes imposed; generate comparative studies among countries adopting similar tourism tax types and/or rates; extend the link between household characteristics and tourism taxes in tourism spending.

This study is guided by the following specific objectives:

i. To critically review the literature on tourism taxation based on; macro and microeconomic analysis as well as conclusions about the impact of tourism taxes.

ii. To analyze the different types and rates of taxes that are imposed by tourism products using destinations in the European Union (EU) as a case study.

iii. To investigate the link between tax on tourism in the EU and its impact on consumer participation and spending on tourism.

iv. To examine the impact of tourism tax on inbound tourist arrivals in small Island economies using the Maldives as a case study.

1.3. Contribution to knowledge and debate

The impact of tourism taxes has been mostly assessed at a macroeconomic level, with only a few studies investigating the microeconomic impacts. Research to date has tended to focus on the impact of tourism taxes on consumer behaviour only in terms of willingness to pay and the nature of the demand curve (Seetaram et al. 2018). Also, the impact of the specific environmental tax such as the United Kingdom's air passenger duties on outbound tourism has been assessed (Seetaram et al. 2014). However, previous studies present different arguments for or against the use of tourism taxes, hence, the need to investigate more thoroughly the link between tourist expenditure and tourism taxation at both micro and macroeconomic levels.

This research contributes to the debate on the impact of tourism taxation on tourist behaviour. Using the European Union (EU) as a case study, an analysis of the impact of tourism taxes on domestic tourism participation and spending, with additional assessment of the moderating role of household demographic features in the tourism tax-consumer behaviour debate has not been previously assessed. Also, the differences across EU macro-regions in terms of the spending behaviour of domestic tourists in the presence of tax on tourism services has not been previously

evaluated in depth. Additionally, the fusion of specific variables, identified in the literature as being influential in terms of tourist behaviour and the introduction of macroeconomic variables, allows the identification of areas of strengths and weaknesses in the key drivers of domestic tourism expenditure.

The multi-valued Heckman model used, measured the effect of tourism tax on the decision of EU households to participate and spend on domestic tourism allowing a direct comparison among EU-Macro regions, with the added benefit of capturing heterogeneity in domestic tourism participation decision across various household types. Four interaction effects were created in the second stage of the Heckman model, to identify not only the effect of tourism taxation on domestic tourism expenditure but also the influence of four of the key socio-demographic features of households in the EU as a whole and across EU-Macro regions. To the researcher's knowledge, there is no evidence that such a comprehensive study has been attempted previously; the majority having focussed on single-issue subjects (i.e., household socio-demographic characteristics; psychographic characteristics; and trip-related characteristics).

The research also contributes to the tourism tax debate for small island economies dependent on tourism. The use of tourism demand literature allied to tourism tax data from the Ministry of Finance & Treasury, the Maldives Inland Revenue, and the Ministry of Tourism as well as tourism and macroeconomic statistics from the United Nations World Tourism Organization (UNWTO) database, has enabled a more holistic interpretation of results from different source markets in terms of tourist behaviour towards tourism tax in the destination. Two policy implications are notable; firstly, the use of tax revenue to remedy budget deficit and grow the economy has adverse consequences on tourism; and secondly, there are even greater harm to the tourism industry if high tourism taxes are not matched by a significant increase in government tourism expenditure on the industry. These reveal some of the dangers of increasing tourism taxes for Island economies dependent on tourism or domestic tourism for EU member states as this hold grave consequences on the local economy.

1.4. Thesis Structure

This thesis consists of seven chapters. The first is the introduction, which gives an overview of the research and presents the background, motivation, and the main

research aim and objectives, which provide reference points for the discussions and conclusions. The levying of tourism taxes is predicated on the burgeoning global tourism industry, including the creation of new tourism services which draws strength from increased globalization, movement of people, goods and services and fiscal reforms particularly in tourism-dependent economies to boost government revenue. This thesis examines the arguments for and against the levying of tourism taxes in two dimensions: first, through its impact on consumption of domestic tourism services, measured as their participation and spending, by households in the EU; and secondly through its impact on international arrivals of tourists to the Maldives, a tourism-dependent small island economy.

Specifically, it pursues five major themes namely: the effect of tourism taxation and the moderating role of children, gender, and income class on domestic tourism expenditure; tourism taxation and consumer behaviour in EU macro-regions; the negative impact of tourism taxation on tourism demand; the adverse consequences of lagged demand, own and substitute price and Asian Financial Crisis; and the impact of tourism taxation on different tourist markets. Additionally, it reviews the importance of household characteristics (household size, location, household income class, gender, age, education, and marital status of household head) albeit, recognising that they are essentially control variables.

The choice of themes is predicated in literature, the majority of which has evaluated these as single-issue items, and tests both the theory and empirical evidence in a holistic approach, which draws them together to enable commentary on the analysis of tourism expenditure/demand. The thesis adds a further dimension, gleaned from a wide-ranging review of the tourism economics literature, to allow a partial fusion of the influence of tourism taxes on household tourism consumption behaviour and international tourism demand.

The second chapter presents relevant economic theories and a literature review on tourism demand and tourism expenditure. This consists of macro-level analysis of the determinants of tourism demand, its background, and traditional determinants, together with a review of factors that have proven important in the literature. The claims that tourism taxes have positive, negative, or mixed impacts are examined regarding the evidence provided in the literature, with examples justifying or refuting that assertion. This is followed by a review of literature on micro-level

determinants of tourism expenditure, with particular emphasis on socio-demographic, trip-related, and psychographic determinants.

In chapter three, a specific literature review is undertaken for tourism taxation with particular focus on diverse tourism tax types which have been examined in tourism research and a resulting body of ensuing debate is documented. Furthermore, a review of different tourism taxes and their economic impact is documented, which suggest that each tax type addresses different tourism issues, and each tourism tax type has different research focuses, data characteristics and analytic tools which are all appraised. Also, in this chapter, notable challenges and further directions are suggested.

Chapter Four discusses models and methods used in the literature in tourism demand modelling with particular focus on panel techniques and other quantitative techniques for assessing both tourism demand and household tourism spending determinants.

Chapter five[1] utilises the Heckman model to assess domestic tourists' expenditure behaviour in the EU with novel attention on the influence of tax on tourism services. This chapter elaborates the data used to achieve the objective of the study. Eurostat's 2010 Household Budget Survey (HBS) is used and a two-part model is applied in line with previous research (Jang and Ham 2009, Disegna and Osti 2016, Lyu and Noh 2017) which suggests that household behaviour in terms of domestic tourism can be modelled in a two-step framework. First, households decide whether to engage in domestic tourism or not. This was modelled using the probit technique. Secondly, the amount to expend was modelled in the second stage using the truncated OLS technique.

The result presented in this chapter shows that in the first stage model, higher tax rates on tourism services may dissuade tourists from participating in domestic tourism services, although higher tourism tax corresponds to higher household spending on tourism in the second stage. This finding takes side with previous studies which adopt macro data on specific tourism taxes with the policy recommendation of an increase in tax on tourism services. However, a high tourism

[1] Chapter five and six are the two standalone empirical chapters which are both papers for publication. These chapters have a specific literature review, data, variables, models, and methods sections which are unique to each chapter.

tax has implication on domestic tourism planning decisions across the European Union (EU) as well as tourism marketers and fiscal policymakers at large.

Chapter six concentrates exclusively on the demand impact of tourism taxation on international arrivals in small economies dependent on tourism. The focus of this chapter is to evaluate the impacts of imposing taxes on tourism and the implications for inbound tourism demand. The group-mean fully modified OLS technique was used in this chapter. Data from 1995 to 2017 on tourism taxation and other determinants of tourism demand identified in the literature were used to assess the impact of tourism tax on tourism demand for top 20 source markets as well as for analysing results for individual source markets. This chapter also presents some sensitivity analysis to demonstrate changes in results when price, tourism tax or the price competitiveness index is used.

The results show that amending tax policies by increasing existing rates or introducing new ones had negative influences on five tourist source markets (China, the UK, Italy, Russia, and France), which accounts for up to 44% of the total international tourist arrivals to the Maldives. This implies that, for destinations dependent on tourism, tax policy has a direct effect on the volume of international tourist arrivals. Also, in absolute terms, inbound tourism demand in the Maldives is inelastic concerning changes in the tourism tax revenue. However, the magnitude and sensitivity to the level of tourism tax elasticity vary across source markets. Inbound tourists from 10 source markets, which accounts for 22% of the total arrivals, seem prepared to pay more for the most part and disregard the broader impact of tourism tax.

Chapter 7 concludes the thesis with a summary of the results and conclusions, referencing theory and extant literature. It includes policy recommendations, limitations of the thesis and indications for further research.

Chapter Two. Theoretical and Empirical Review of Literature on Tourist Behaviour and Tourism Demand

2.1. Introduction

This chapter presents a synthesis of the relevant theories guiding this thesis as well as the empirical literature on what has been covered about micro- and macro level analysis of tourism demand, its determinants, the estimated response to changes in tourism taxation, and common methodology used in the literature.

The thesis seeks to establish the micro-level effects of tourism taxes and, since tourist behaviour is primarily captured by their demand and expenditure which underpin the main tenets of consumer theory, it uses tourism demand and tourist expenditure as its measures. The thesis utilises variables which feature in tourism demand literature and addresses four specific themes in addition to tourism taxation, namely, socio-demographic characteristics, trip-related characteristics, psychographic characteristics, and country-level factors on the micro-level part: and relative income, relative price, substitute price, and population on the macroeconomic part.

However, these themes require the exploration of the influences surrounding their selection as determinants of tourist behaviour. Consequently, the literature review includes the relationship between tourism demand and tourist expenditure, and their key determinants and identifies gaps in knowledge that generates the hypotheses on which this thesis is centred. Also, since the review of micro- and macroeconomic determinants of tourism demand is not sufficient to provide a necessary perspective on the interpretation of the results and provide an appropriate contribution to knowledge, a review of research in tourism taxation is carried out in the next chapter to present a clearer picture of the literature.

2.2. Relevant Economic Theories: Consumer Theory

The concept of preferences, choices, utility, demand, and welfare are key components of consumer theory which has been used significantly in the tourism literature to explain tourism demand and consumer behaviour in tourism. Thus, in this subsection, the dynamics of tourist behaviour and tourism demand functions are examined with a discourse on the impact of changes in prices and consumer

income. Also, the impact of changes in other variables such as tourism tax or other government policy is understood from the tourism demand framework.

In other words, given that one of the aims of consumer theory is to derive the demand functions from the utility maximization and budget constraints of the consumer, it becomes possible to examine the effect of own and substitute price changes, weather changes, and/or fiscal policy (e.g., tourism taxes) changes on changes in tourism demand, which arises from the pass-through effects of such policy changes. Since economists use models to capture quantifiable social phenomena, consumer theory produces a model of tourist choice, budget constraints and how these lead to tourism demand.

In economics, tourists' preferences are explained, using mathematical economic tools, by utility functions of several forms, such as the Cobb-Douglas, perfect complement, perfect substitute, linear expenditure system, Stone-Geary, and the constant elasticity of substitution utility functions. Although, earlier theories fail to establish the axioms of completeness, transitivity and continuity of tourist choices, yet, these axioms have been established through empirical tests of real-valued utility functions, discrete functions, direct as well as indirect utility functions (Peitz 1995). From these utility functions, demand functions such as the Marshallian, Hicksian and Walrasian demand functions are derived and an extension to calculating tourist welfare is made possible. To arrive at these, however, it is needful to present the tourist's preference optimization problem, in both neoclassical and indifference curve theories.

The end goal of revisiting these theories is in two folds: first to highlight how the consumer demand curve is derived with traditional determinants, and secondly to examine how changes in prices and income (and other variables such as taxation) variables alter consumer behaviour captured by changes in their demand curve. This is relevant for empirical assessment of determinants of tourism spending (in the EU), and international tourist arrivals (inbound tourism to the Maldives).

2.2.1. Preferences and Consumer Behaviour

Tourists are usually faced with commodity (or destination) bundles and they make choices based on their preference, which in this study explains their behaviour.

There are also commodity bundles which comprise of a complete list of various baskets of goods. Also, commodity bundles can be strictly or weakly preferred, or a tourist can be indifferent among them. A strictly preferred commodity bundle represented as $(x_1, x_2) \succ (y_1, y_2)$ means that the tourist strictly prefers (x_1, x_2) to (y_1, y_2), and always want the *x* bundle instead of *y*. On the other hand, however, a weakly preferred bundle is represented as $(x_1, x_2) \succcurlyeq (y_1, y_2)$ which means that the tourist weakly prefers (x_1, x_2) to (y_1, y_2). A tourist can also be indifferent in choosing either bundle *x* or *y* i.e. $(x_1, x_2) \sim (y_1, y_2)$. This means that the tourist's measure of satisfaction remains the same if either bundle is consumed. The choices can be same good available in various forms or different products (or destinations); therefore, preference is used to order a basket of goods.

where:

$x_1\ x_2\ x_3$ = tourism products in bundle *x*

$y_1\ y_2\ y_3$ = tourism products in bundle *y*

$\succ$ = strict preference or preferred to

$\succcurlyeq$ = at least as good as

$\sim$ = indifferent

To order tourist's preferences, however, the study assumes the standard economic properties of completeness, reflexivity, transitivity, and continuity. By completeness, the study assumes that bundles *x* and *y* can be compared, and the tourist can choose when presented with the two bundles. The study also assumes that tourists can make a 'best' choice according to their preference, hence, in a basket *X* with commodity *x*, *y* and *z*, if $(x_1, x_2) \succcurlyeq (y_1, y_2)$ and $(y_1, y_2) \succcurlyeq (z_1, z_2)$, then $(x_1, x_2) \succcurlyeq (z_1, z_2)$. Also, continuity axiom implies that the strict preference behaviour of the tourist is continuous and maintained. In other words, a tourist is consistent in the choice, if when faced with two baskets of goods, A and B, he prefers A to B, it then follows that he cannot prefer B to A. If the tourist prefers commodity A to B and B to C, it then follows that A is preferred to C and cannot prefer C to A. This is transitivity of choices.

Thus, if these four axioms are satisfied, tourist preference can be represented using a continuous utility function (Wold 1943, Wiley and Debreu 1964), because it

allows for attaching ranks to commodity bundles. The utility is the satisfaction of a tourist derives from consuming units of a product. There are other axioms about tourist preferences, two of which is the convexity (Neoclassical assumption of diminishing marginal utility) and the axiom of strict convexity (Indifference curves and the Marginal Rate of Substitution).

In the case of tourism demand, a tourist may be indifferent to some tourist destinations, while they would consider other tourist destinations or activities more pleasurable above others. This example illustrates the idea of tourist preference.

2.2.2. Neoclassical Utility Theory

As stated previously, one of the main benefits of consumer theory is the framework it presents which allows for an assessment of the impact of policy changes on the utility of tourists given their budget constraints. In the analysis of tourist preferences, theories such as marginal utility, indifference curve, revealed preference hypothesis, and others have been used. The marginal utility theory as the name suggests, focus on the marginal utility (MU), which is the additional satisfaction that a tourist derives from consuming extra units of a commodity. Under the assumption that tourists are rational, they buy a commodity only if it gives maximum utility. Other important assumptions in the theory include the constant marginal utility of money; perfect knowledge of tourist (individual or household or national) income, tourism goods and services available to the tourist, their prices and quantity; non –substitutability of goods bought by the tourist; total utility (TU) being a function of the quantities of tourism goods consumed; and diminishing marginal utility.

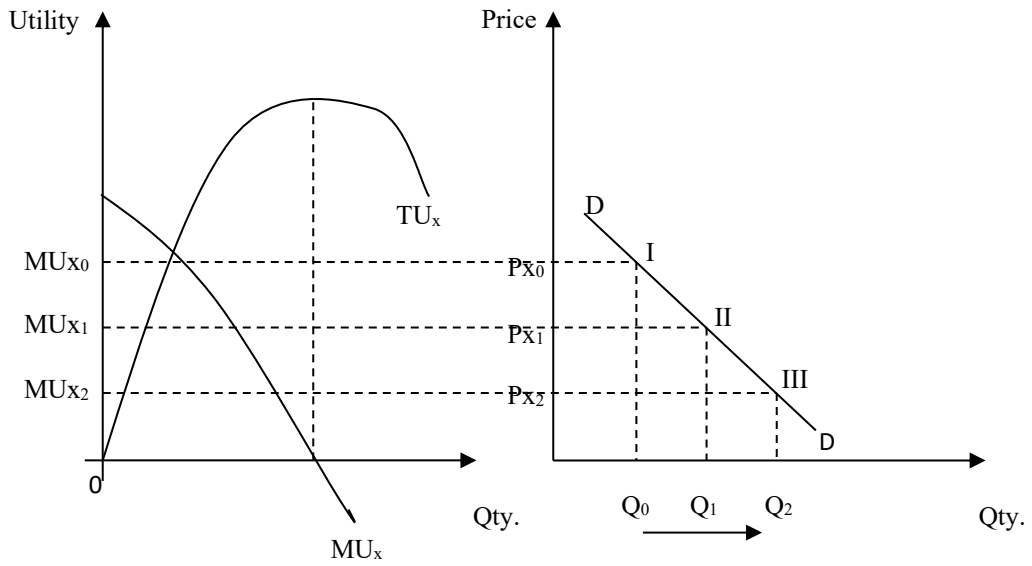
Although the marginal utility approach helps explain tourist behaviour in terms of the demand function and price consideration by the tourist, yet, the utility cannot be measured using ‘utils’ and tourists do not have perfect knowledge. Also, since tourists can substitute products, assuming diminishing marginal utility does not apply to luxuries for which leisure falls, but only to necessities. Given these limitations, the ordinal utility theory was developed by economists such as Vilfredo Pareto (Pareto 1897, 1898), Eugen Slutsky (Slutsky 1915), John Hicks (Hicks 1939, 1946) and Gerard Debreu (Debreu 1959) as an alternative and more specific measurable approach in the analysis of consumer behaviour. This approach assumes rationality, consistency and transitivity of choice, ranking of baskets of

goods by the consumer and a diminishing marginal rate of substitutions (MRS) among the baskets.

The behaviour of the tourist considers rational decision making and a desire for equilibrium. In the marginal utility theory, the tourist is said to be at equilibrium in the consumption of a commodity when the utility is maximized. Thus, consumers equilibrium or utility maximization condition is stated as $MU_x = P_x$ (If the consumer buys only one commodity). By implication, if $MU_x < P_x$, it is rational for the consumer to reduce the consumption of commodity *X*. Also, if $MU_x > P_x$, the consumer should increase the consumption of commodity *X*. If the consumer buys only two commodities, say x and y, the utility is maximized when $MU_x/P_x = MU_y/P_y$ and in the case of three commodities, say x, y and z, the utility is maximized where $MU_x/P_x = MU_y/P_y = MU_z/P_z$.

In analyzing tourist behaviour, marginal utility is relevant to the theory of demand. Given that the tourist is in equilibrium or maximizes utility when marginal utility equals price ($MU_x = P_x$), the demand curve of the tourist can be derived as in figure 2.1.

Figure 2.1. Marginal utility and Demand Curve



Source: Author

From panel A in figure 2.1, when TU is increasing, MU also decreases but below TU, TU gets to a maximum, as MU equals zero and TU begins to fall as MU

becomes negative. MUx decreases from MUx_0 to MUx_2, as the unit of commodity x consumed increases from Q_0 to Q_2. Since MUx = Px when the consumer is at equilibrium, it then follows that Px falls from Px_0 to Px_2 as quantity demanded increases from Q_0 to Q_2 as shown in panel B of figure 2.1. Panel B is a downward slopping demand curve which shows that the lower the price of commodity X, the higher the quantity (Qty.) demanded and vice-versa.

This analysis signifies that when there is an increase in the price of tourism activities as a result of a tax imposition, there is a fall in the demand for tourism.

2.2.3. Ordinal Utility – Indifference Curve Approach to Preference Maximization

The ordinal utility theory uses the indifference curve (IC) as a tool in the analysis of consumer behaviour to show points representing a different combination of a basket of two goods that give the same level of satisfaction to the consumer. Thus, the consumer is indifferent in the consumption of the various combinations of the two goods since they give equal levels of satisfaction. In maximizing utility, therefore, the budget constraint of the consumer is set tangent to the highest possible indifference curve. The budget constraint represented by the budget line shows the limit of the number of baskets of goods that can be acquired by the consumer given his income and the prices of the goods. Also, changes in consumer income, as well as fiscal policy changes such as taxes and subsidies, affect the price which in turn constraints consumer's budget further.

Therefore, to understand consumer's maximizing behaviour, which is to maximize utility subject to a budget constraint (*max U(x)* subject to *px = Y)*, some further basic statements about consumer's preferences are made:

i. That a consumer is rational and so chooses only the best alternatives

ii. Has a fixed amount of income Y

iii. *U(x)* is the utility function of the consumer

iv. *P* is a vector of prices of goods

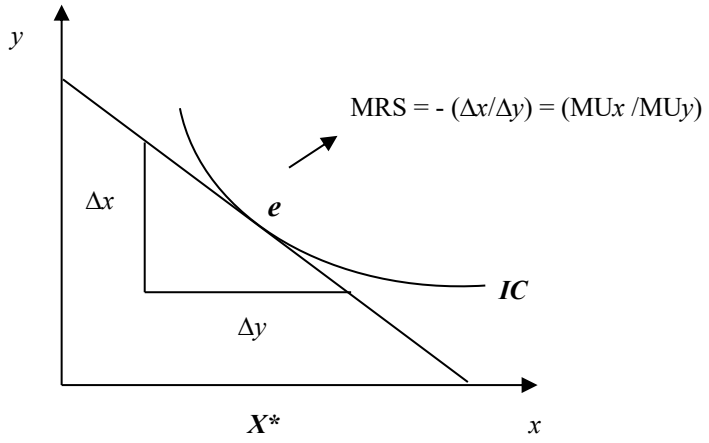
v. The utility function, *U(x)* is continuous, and the constraint set is bounded – it is assumed that *p>0 i.e.* the price is a non-zero positive amount

vi. That consumers optimal bundle is "homogeneous of degree zero" in prices and income. This is an important assumption. It means that consumer's budget constraint and by implication his/her optimal choice sets are unaffected if varied by a positive constant.

$$max\ U(x) \qquad \text{subject to } px = Y \qquad (2.1)$$

The solution to this problem is a unique bundle that maximizes utility i.e. ***x**** and is used to state the **demand function** of the consumer ***x*(p,m)***. *x** shows that the unit of goods bought by the consumer is determined by prices and income (Varian 1992). There are several functional forms in which a consumer's optimization problem can take. The notable forms include the Cobb-Douglas and the CES[2] utility functions. The solution to these problems, however, yields the demand function and the optimal points are represented by the tangency of the budget line and IC.

Figure 2.2. Marginal Rate of Substitution



Source: Author

An indifference curve is a locus of points showing the different combination of a basket of two goods that give the same level of satisfaction to the consumer. This means that the consumer is indifferent in the consumption of the various combinations of two goods because they all give the same level of satisfaction. As

[2]Constant Elasticity of Substitution

shown in figure 2.2, the IC has a negative slope which is called the marginal rate of substitution ($MRS = MU_x/MU_y$). Movement along the indifference curve means movement on the same level of satisfaction, and the consumer only substitutes one good for the other along with the IC. Also, higher IC denotes a higher level of satisfaction and vice versa.

The implication of ordinal utility theory to tourism demand can be exemplified by the case of a group of tourists who visits any tourist destination among a group of destinations within their income.

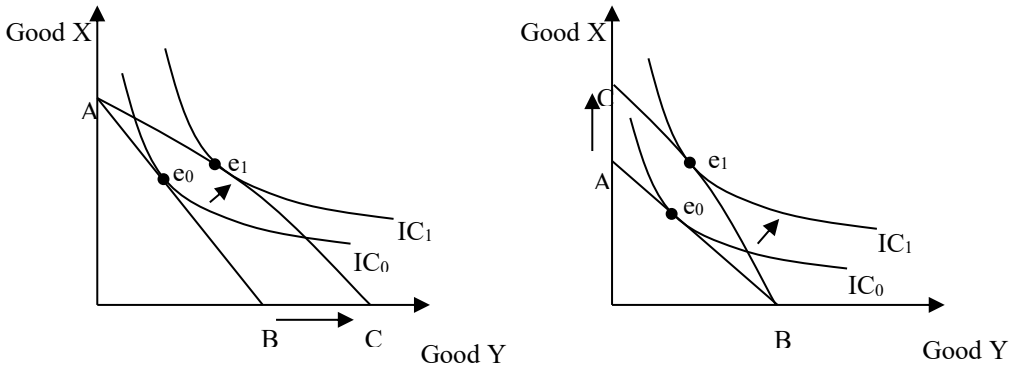
2.2.4. Consumer Demand

Consumer's demand function [***x*(p,m)***] shows the relationship between a unique bundle given consumer income and commodity prices. It is homogeneous of degree zero and maximizes consumer's utility. ***x*(p,m)*** is the *Marshallian demand function*. It contrasts the *Hicksian demand function* in which the optimal bundle is determined by utility and prices. Hence, the individual demand curve is unobservable as it is determined by the utility, not income. The changes in choice behaviour of consumers can be understood using changes in the demand curve. The demand curve changes as prices and income changes. When there is a change in relative price, it means the price of one of the goods changes while the price of the other remains constant. Change in relative price can be an increase or a decrease in the relative price

2.2.4.1. Change in relative Price

When there is a decrease in relative price, the budget line, rotates outward along the axis of the good whose price decrease, indicating that more of the good is bought by the consumer and the consumer is placed on a higher level of satisfaction as the indifference curve shifts outward and becomes tangential to the new budget line as illustrated in panels a and b of figure 2.3.

Figure 2.3. Effect of decrease in the relative price



Panel a. Reduction in the price of Y Panel b. Reduction in the price of X

Source: Author

In panel a, of figure 2.3, the original budget line is AB while the consumer's original level of satisfaction is on the indifferences curve IC_0, and the original equilibrium point is e_0. However, with a fall in the price of good Y, the budget line rotates outward from AB to AC indicating that more of good Y can be bought by the consumer. This causes the indifference curve IC_0 to shift outward to IC_1 indicating that the consumers level of satisfaction has increased at point e_1 when the new budget lines become tangential with it. Also, in panel b of figure 2.3, the initial budget line is AB, the initial level of satisfaction is on the indifference curve IC_0 and the initial equilibrium point is e_0. With a fall in the price of good X, the budget line rotates outward from AB to BC indicating that more of good X can be bought by the consumer. This causes the indifference curve IC_0 to shift outward to IC_1 indicating that the consumer's level of satisfaction as increased at point e_1 when the new budget line becomes tangential with it. A similar analysis can be conducted when there is an increase in the price of either good 1 or 2.

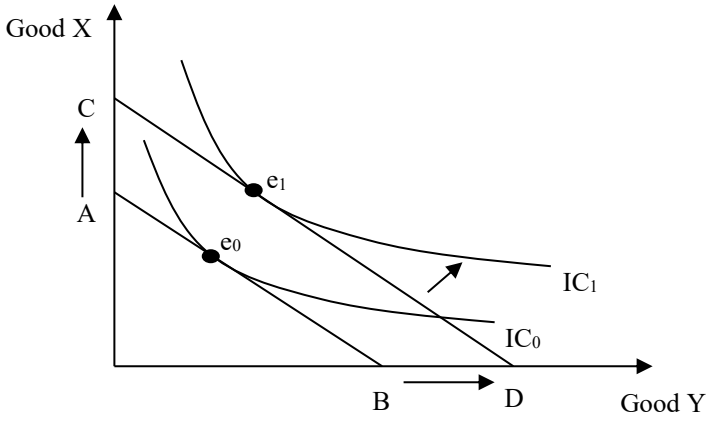
This analysis signifies that when there is an increase in one aspect of tourism for example flight tickets, it, therefore, suggests less spending on other aspects of tourism such as hotel accommodation and site visits.

2.2.4.2. Change in Consumer's Income

When there is a change in consumer's income, the budget line shifts *completely* away from its original position. Change in consumer's income can be an increase or a decrease. For example, when there is an increase in consumer's income, the budget line shifts *outward* from its initial position, indicating that more of the two goods can be bought by the consumer and he is placed on a higher level of

satisfaction as IC shifts outward establishing a new equilibrium point with the new budget line as illustrated in figure 2.4.

Figure 2.4. Effect of increase in consumer's income



Source: Author

In figure 2.4, the original equilibrium point is e_0 while the original budget line AB is tangential to the original indifference curve IC_0. With a decrease in consumer's income, the budget line shifts inward to CD and the consumer is placed on a lower level of satisfaction as shown by the inward shift of the indifference curve IC_1. The new equilibrium point is e_1. To illustrate the change in income with regards to a tourist tax, the income available to a tourist is reduced hence, tourists have less income to spend on tourism goods and services.

The importance of interacting theoretical analysis with econometric analysis cannot be overemphasized. The several models of optimizing consumer choice behaviour result in relationships that can be empirically investigated (Varian 1992). This study derives its hypothesis from theory and also use data available to provide estimates of parameters of the models. This is made possible with the selection of appropriate functional forms.

2.3. Macro level analysis of tourism demand

Consumer theory posits that demand for a good or service is explained by several factors such as the price of the product; price of other commodities; income of the consumer; consumer's taste and preferences; weather conditions; and government

policies. As such, this theory has been widely applied to the analysis of tourism demand with studies reporting elasticities estimated from tourism demand functions. As shown in the reviews by Crouch (1994), Witt and Witt (1995), Lim (1997), Song et al. (2008), and Peng et al. (2015), among the factors, tourism demand is largely influenced by relative income which is usually measured using the Gross Domestic Product (or Real GDP) of tourist origin and tourism destinations; their relative prices measured using Consumer Price Index or exchange rate or a mix of both; substitute prices of competing destinations; the population of origin countries; and travel costs to destination.

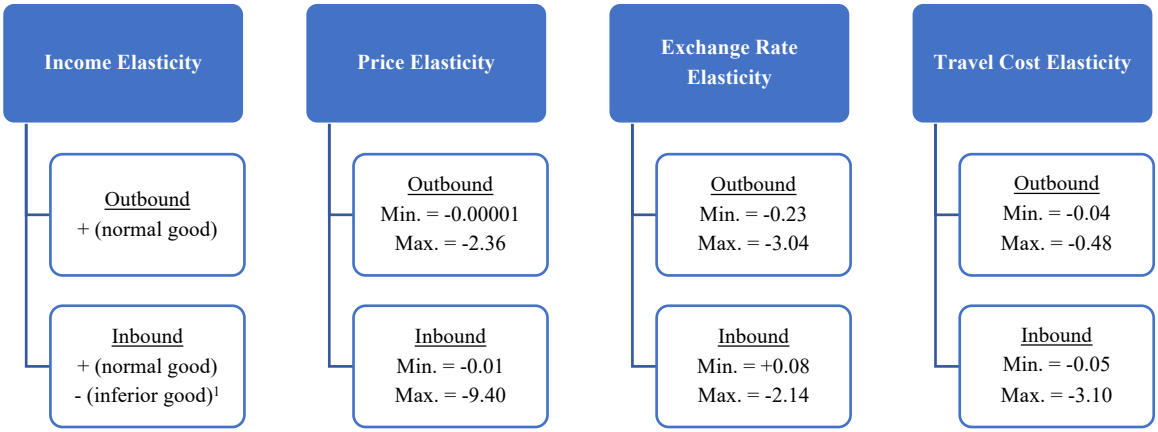
The importance of studying the determinants of tourism demand cannot be overemphasized, given that changes in tourist behaviour matters to destination marketers, host community and policymakers alike. According to consumer theory, a change in tourist behaviour can be understood via a change in the demand curve, and the demand curve changes as prices, income or other factors changes. For example, in the case of price and income, a decrease in the price of a destination rotates tourists' budget line outward along the axis of the destination whose 'price' decreases, indicating that tourists potentially consider a visit. This places them at a higher level of satisfaction as their indifference curve shifts outward and becomes tangential to their new budget line. Changes in other factors such as higher number of migrants from an origin country; lower tourism taxes; better weather or climate quality; low possibilities or risk of terrorist incidents, disease outbreak; and advanced transport systems, can theoretically lead to increase in tourism demand.

2.3.1. Traditional Determinants of Tourism Demand

The traditional determinants of demand continue to be important as no model is complete without them. They include relative income; price (usually proxied by a consumer price index); travel cost (usually proxied by oil price); price of substitute destinations; and exchange rates. Other common determinants which are mainly qualitative in tourism demand modelling include tourists' expectations; preferences; and habit persistence. While these qualitative determinants are mostly unobservable or unmeasurable, the traditional determinants of tourism demand have continually gained relevance in studies on tourism demand modelling. In figure 2.5, a survey of studies on tourism demand which reported elasticity

estimates of the traditional determinants is presented[3]. The most studied regions are Asia and Europe, followed by the Americas. This aligns with the findings in the meta-analysis of income and price elasticities of tourism demand by Peng et al. (2015). Additionally, panel data techniques are commonly used with annual frequency followed by quarterly frequency. The use of daily data is less common, except for Wang et al. (2018). Also, the common measures of tourism demand are the number of tourist arrivals and expenditure.

Figure 2.5. The estimated elasticity of traditional determinants of tourism demand post-2008



[1]Rodríguez et al. 2012 and Schiff and Becken (2011) both report negative income elasticity. The former suggests that unlike other tourism types, academic tourist arrivals are less responsive to the traditional determinants when compared to other types of tourists.

Source: Author

However, the determinants of tourism demand have evolved over the past decade following the outbreak of diseases; terrorist attacks; the global financial crisis of 2007 – 2008; rising concerns about global warming and emissions; the availability of new data structure as well as improvement in econometric methods. The tourism industry has also received more attention due to its increasing economic importance and has attracted new forms of tourism taxes. Thus, apart from prices, income, population, price of substitutes, travel cost and the use of dummies to capture qualitative determinants, the tourism demand literature in the past decade has

[3] These studies are those published between 2008 and 2019 and are those reporting inbound or outbound tourism demand elasticities. They are also studies published in tourism-related journals such as tourism economics, journal of travel research, tourism management, and annals of tourism research. Also, due to the multidisciplinary nature of issues surrounding tourism taxation and tourism demand, articles published in journals such as energy economics; ecological economics; journal of air transport management; and transportation research were also included.

placed specific emphasis on the impact of other determinants. In what follows, studies on tourism taxation as a determinant of tourism demand are reviewed.

2.3.2. Taxation and Tourism Demand

Tourism activities have attracted government policies for tax purposes as early as 1970, with an emphasis mostly on resort hotels (room or bed taxes) and air transport. However, in recent times, the government have increased the number of taxes on tourism-related activities. According to UNWTO (1998, p.36), examples of taxes on tourism services include entry and exit charges; air travel taxes; airports, seaports, and road borders taxes; road taxes; car rental; visitor attractions; environment; and gambling. Furthermore, these taxes affect tourist flow and tourism stakeholders, hence, the interest of researchers to evaluate the impact of tourism taxes. Early evaluation of the impact of these taxes was on the tourism industry and was mostly theoretical. Consequently, the direction of impact assessments was divergent and there was hardly a consensus. For example, in the case of the US, studies that investigated the accommodation tax recommended either an increase in tax (Combs and Elledge 1979); a decrease (Fujii et al. 1985) or both (Hiemstra and Ismail 1993).

In terms of the kinds of tax studied, between 1970 and 2000, accommodation taxes were mostly studied with one theoretical based-study (Abeyratne 1993), highlighting the adverse consequences of air transport tax on the tourism industry. However, following developments of the applied (computable) general equilibrium models, more economic-wide impact assessment of indirect taxes levied on tourism services were carried out. The impact of taxing tourism for environmental reasons also became pronounced following the study by Palmer and Riera (2003). Particularly, in the last decade, more empirical studies emerge from the literature highlighting the impact of air passenger duties (UK); Carbon tax (Australia); Flight departure tax (Austria and Germany); and the EU emissions trading system. However, most of the documented empirical evidence has been documented for countries and regions such as Australia, the UK, and the EU (Table 2.1). The importance of assessing the impact of this category of a tourist tax on tourist flows is due to its impact on a major part of the tourist budget i.e., travel cost.

Table 2.1. Summary of key studies on the response of tourist flows to tax changes

Author (Year) and Country	Research Context	Type of Tax	Data and Method	Estimated Elasticity	The measure of Tourism Taxation
(Gago et al. 2009) / Spain (Arrivals)	Effects of specific and general tourism taxation in Spain	GTT	NAM-95 / CGE	-0.11 to -0.21	VAT on tourism services – hotels, restaurants, and similar services
(Blanc and Winchester 2012) / EU (Departures)	Impact of additional costs imposed on airlines by the European Union (EU) Emissions Trading System (ETS) on tourist arrivals in 26 Caribbean states	EU Emissions Trading System (ETS)	26 EU countries from 2003-2010 / Data Calibration and Sensitivity Analysis	Less than 0.4	EU emission allowances (EUAs) for each tonne of carbon dioxide (CO2)
(Dwyer, Forsyth, and Spurr 2012) / Australia	Effects on the Australian tourism industry from the introduction of a carbon tax	Carbon Tax	MMRF-GREEN / Dynamic CGE	NR	A mix of fixed rate of carbon price and emissions trading schemes (ETS)
(Ihalanayake 2012) / Australia	Effect of tourism tax changes in Australia	GTT	ORANI-G / TTM / ATSA	NR	General sales tax with more emphasis on passenger movement charge and aircraft noise levy
(Seetaram et al. 2014) / UK (Outbound)	Effect of the APD on UK outbound tourism demand for 10 international destinations	UK APD	10 countries from 1994: Q4 to 2010: Q4 / ARDL	-0.01 to -0.99	Travel tax directly charged to the UK residents travelling to the destination *i* at time *t*

(Forsyth et al. 2014) / Australia (Departure)	Effect of increase in Passenger Movement Charge (PMC) on tourist flow and expenditure	Departure Tax a.k.a. PMC	MMRF / CGE	-0.5 to -1.0	Rate of Australia's passenger movement charge. Elasticity depends on assumptions about the price elasticity of demand for tourism products or service affected by the tax
(Lee 2014) / US (Hotel Arrivals)	Effect of bed tax on hotel performance.	Bed tax	41 hotels for 9 quarters / Random effects spatial panel model	NR	Dummy variables for hotels increasing bed tax.
(Ponjan and Thirawat 2016) / Thailand	Effect of tourism tax cut policy on the tourism industry	GTT	TRAVELTHAI model / Dynamic CGE	NR	Indirect tax i.e. simulation of commodity tax cuts and subsidies
(Meng and Pham 2017) / Australia	The economic impact of a carbon tax on the tourism industry	Carbon Tax	SAM & CGE	-0.413	Carbon price set at A$23 per tonne of carbon emissions
(Seetaram et al. 2018) / UK (Departures)	WTP; Effect of APD on the demand curve and elasticities	UK APD	Survey / CVM	Elastic and then Inelastic	APD paid (conditional on *km* travelled and on travel haul)

Key: GTT = General Indirect Taxation levied on Tourism Services; NR means not reported in the study; ATSA = Australia Tourism Satellite Accounts; ORANI-G = An applied general equilibrium framework, with 'G' as generic making it adaptable for several empirical purposes; TTM = tourism tax model; MMRF = Monash Multi-Regional Forecasting; NAM = National Accounting Matrix; APD = Air passenger duty; ARDL = Autoregressive distributed lag model; AT = Accommodation tax; CVM = Contingent Valuation method; WTP = Willingness to Pay; SCM = Synthetic control method; SAM = Social Accounting Matrix; ARIMA = Autoregressive integrated moving average

Currently, the debate on the specific impact of tax on tourism demand is still unclear. Whilst some studies reported a negligible impact on tourist arrivals, others argue against levying tourism taxes. Also, the assumptions about price elasticity of demand for tourism products is an important consideration and matters for

investigating tax impacts in CGE models (Forsyth et al. 2014). Also, a mixed impact of tourism taxes is evident in the literature and arguably depends on the market power of the destination (Sheng and Tsui 2009), or the share of tourism demand component of a commodity consumed by both domestic residents and tourists (Gooroochurn 2009).

Another consideration is the form of tourism taxation in place i.e., specific (e.g. carbon tax) or general (indirect tax e.g. VAT). Although the use of a specific tourism tax such as an air passenger duty is discriminatory and brings about price distortions (Seetaram et al. 2014), other general tourism taxes like VAT has potentials of tax evasion but can be welfare-enhancing with a slight modification on the equity effects when levied on consumption of luxury goods targeted at richer households for income-redistribution purposes (Gago et al. 2009). Also, a number of researches on tourism taxation has focused on environmental taxes. Sun (2016) argues for the use of technically efficient means of production to reduce carbon emissions from tourism-based activities, rather than merely taxing tourism to correct for emissions as a negative externality. Also, there are growth effects on the economy that eventually reduces the environmental impacts of tourism-based activities (Qureshi et al. 2017). Furthermore, in accounting for tourism emissions, an important component of the environmental impacts of tourism is the level of development of the tourism destination (Tao and Huang 2014). Thus, to mitigate the effect of tourism on the environment, the use of green technologies and efficient management of tourism resources is recommended, but this is often more pronounced in developed than developing countries (Alam and Paramati 2017).

In sum, there is an opportunity to investigate the links between tourist flows, travel cost, and tourism tax meant to correct for negative externalities or other purposes. A sum of the literature shows that an environmental-based tourism tax adversely affects key macroeconomic variables; slows down the growth of real GDP; contracts tourism output; and has negative spill-over effect on the global economy (Dwyer, Forsyth, Spurr, et al. 2012). Additionally, tourism arrivals reduces due to an emissions trading system earmarked to curb negative environmental effects of tourism (Blanc and Winchester 2012), but departures do not respond significantly to air passenger duty imposed as tourists tend to be willing to pay more for the environmental costs they generate (Seetaram et al. 2014, 2018).

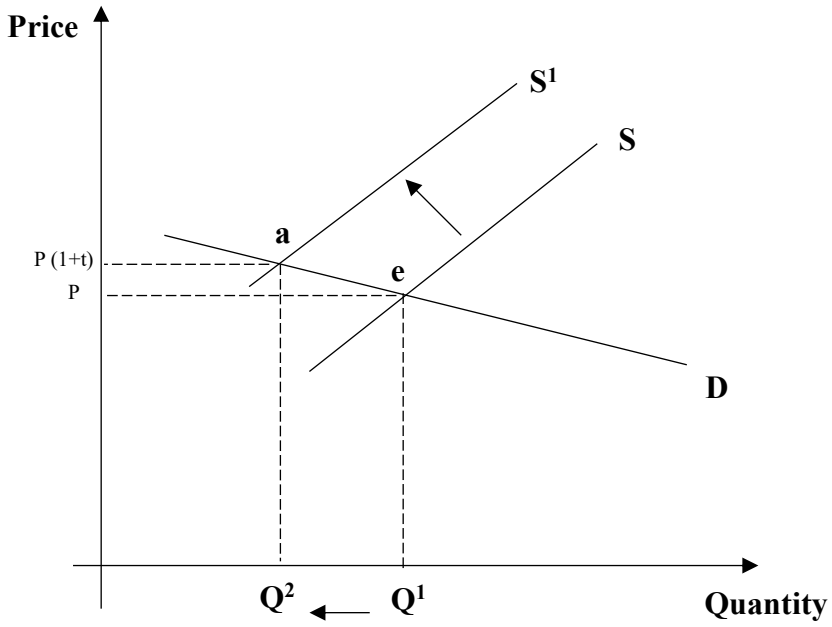
2.3.3. The incidence of taxation

The incidence of tax describes the effect of a tax and where the burden of tax finally rests. It also indicates the initial effect of tax on the demand and supply of the product or service been taxed. For instance, when a sales tax is imposed, the burden of tax will be shared by the consumer and the producer. However, the ability to shift the tax will depend on the elasticity of demand and supply for the product. An analysis of the incidence of tax is also important for the discussion on the distribution of welfare arising from a tax (Fullerton and Metcalf 2002).

The incidence of tax in an economy can be analysed using models that focus only on specific markets such as labour market, tourism market, etc., referred to as partial equilibrium models. Partial equilibrium models are based on Marshallian analysis and the tools of demand and supply sides both contribute to the structure and impact analysis in the market. This makes the structure of the industry or supply-side a major aspect in determining the incidence of tax in the market.

In measuring the incidence of tax, the elasticity of demand and supply are important considerations. The higher the elasticity of demand, the lower the incidence of tax on consumers. This, however, also depends on the structure of the market. Also, in the case of indirect taxes such as VAT, there are no noticeable effects in the short run, for a reduction in tax, but immediate effects are noticeable in the short-run (Copenhagen Economics 2007). If such taxes are imposed on specific industries such as tourism, however, inefficient firms may seek to provide similar products at very low quality. Furthermore, Price (P) and marginal costs (MC) are equal i.e., P=MC when there is no tax, but P>MC when tax is increased. Marginal cost is the unit change in total cost as a result of a unit change in output. Also, since there are majorly two forms of market i.e., perfect and imperfect markets, it is assumed that a perfectly competitive market in which the MC represents the supply curve of the producer.

Figure 2.6. Incidence of a tourism tax



Source: Author

Figure 2.6 shows a partial equilibrium analysis of the impact of a tax on the product market. Lines D and S are the market demand and supply curves respectively. D and S intersect at market equilibrium point e. Price increases from *p* to *p(1+t)* when a tax is levied, which reduces demand. The supply curve is affected by tax indicating a reduction in production and employment. This analysis has potentially varying income and substitution effects and can also vary depending on the slope of demand and supply curves, as well as the type of market and product been taxed.

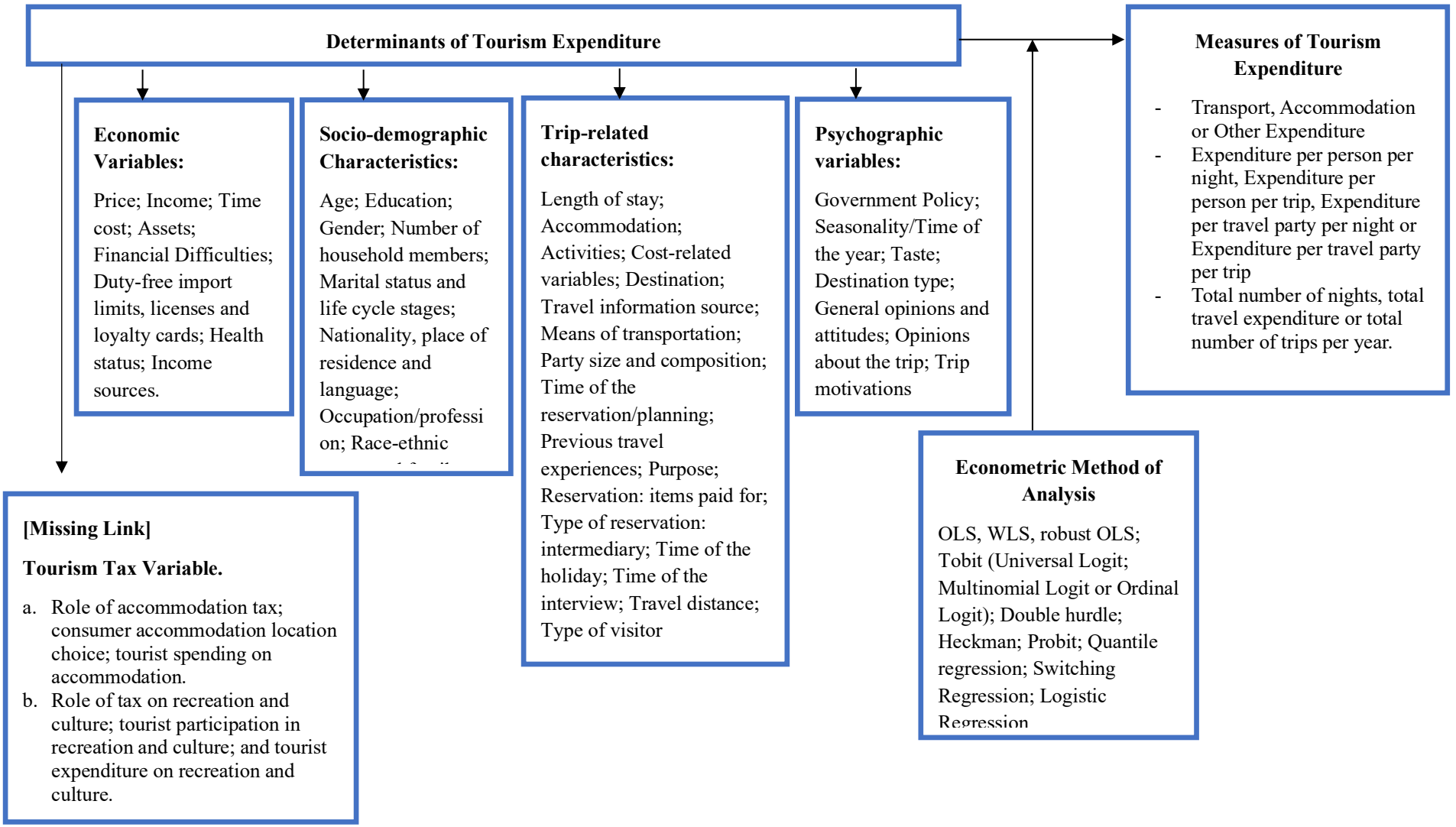
In the tourism literature, the incidence of tax has been assessed in the case of tax on accommodation or hotel room rentals. According to Bonham, et al. (1992), accommodation tax has no significant effect on real net hotel rental receipts and in terms of incidence, the accommodation tax does not significantly put burden on hotel operators. This suggest that the tax reduced real net rental receipts by about 1 percent. This suggest that the hotel room tax is almost fully shifted forward to tourists with no significant revenue loss to hotel operators. In addition, Mak (2006) sought to answer amongst other questions, who ultimately bears the burden when tourists and tourism suppliers are taxed. The study argued that a well-designed system of tourist taxation can benefit the residents of destinations by broadening and increasing the revenue elasticity of the destination's tax base.

2.4. Micro level determinants of tourism expenditure

Studies on the microeconomic determinants of tourist expenditure have focused on the factors that influence consumer spending, its amount, particular goods purchased, and have also utilized specific approaches as shown in figure 2.7. Whilst some studies analyse tourist expenditure at a particular holiday destination, other studies consider tourism expenditure as a general item in the family budget. Studies have also used specific surveys on tourist behaviour (Fleischer and Pizam 2002, Mergoupis and Steuer 2003, Toivonen 2004, Nicolau and Más 2005, 2009, Eugenio-Martin and Campos-Soria 2011), or structural surveys drawn up for other purposes (Hagemann 1981, Van Soest and Kooreman 1987, Davies and Mangan 1992, Cai et al. 1995, Melenberg and Van Soest 1996, Cai 1998, 1999, Alegre and Pou 2004, Weagley and Huh 2004, Alegre et al. 2009, Jang and Ham 2009, Zanin and Marra 2012).

Tourism expenditures are carefully examined by policymakers, planning officials, marketers and researchers to determine its effects on the local economy. A decision to travel is indirectly affected by the number of funds available. Most studies have identified traveler's demographics, trip-related characteristics and psychographic variables as important determinants of travel expenditure. Research showing the role of tourism taxes in tourists travel behaviour is scant.

Figure 1.7. Framework for Microeconomic Analysis of Tourism Expenditure



Source: Author

2.4.1. Socio-demographic Determinants

In consumer theory, the quantity of demand is closely related to factors such as population, income, prices, taste, marketing and other social, cultural, geographic and political factors. However, income is an important determinant of demand. In tourism studies, family decisions to go on vacation and pleasure travel are determined by their income. Although consumer income is positively correlated with the length of stay, family size or travel party and composition alters the family's travel plans and preferences for goods and services during a trip. Other socio-demographic determinants include age, education, occupation, gender, marital status, race, country of origin. Age and origin are more commonly used than others.

According to Lawson (1991), age, marital status, income and length of stay and accommodation type play a significant role in travel expenditures. Gender is reported as a less important variable for the tourism industry, although men and women may travel for different purposes and their preference for travel experience also differs. For instance, while most men traditionally seek action and adventure, many women are likely to be more interested in the cultural and educational experience, with safety or security being a priority. Furthermore, education may provide training and preparation for some types of recreation activities. The impact of education on broadening one's perspective towards leisure pursuits was also noted by Burdge (1969). Cai et al. (1995) concluded that the amount of education a household head received is expected to have a positive relationship with the expenditures on all travel-related product categories.

2.4.2. Trip-related Determinants

Trip-related characteristics are found to be important in accounting for travel expenditures (Jang et al. 2003). Trip-related characteristics include the length of stay, travel party, travel experience, and purpose of trip are some of the influential variables affecting tourism expenditures pattern. Pizam and Jansen-verbeke (1997) found that trip-related characteristics affect the total expenditure more than the socio-demographic variable for foreign travel markets (France, Germany, Japan and the UK). Smallwood and Blaylock (1981) postulated that the number of children is expected to harm food expenditures, while adults should have a positive impact on food expenditures. Reservation date, travel distance, transport mode,

time of the year, travel cost, number of adults, type of hotel and group travel are some of the dummy variables that are significant in determining tourism expenditure (Mak et al. 1978, Aguiló Perez and Juaneda 2000, Hong et al. 2005, Wang et al. 2006, Crouch et al. 2007, Marcussen 2011, Thrane and Farstad 2011, Alegre et al. 2013, Marrocu et al. 2015, Disegna and Osti 2016, Salgado-Barandela et al. 2018).

According to Cai et al. (1995) posited that the number of children may represent time constraints on parents taking care of the children, although, number of children was not considered a different variable affecting the expenditures. Travel expenditures of repeat visitors and first-time visitors were compared. The study revealed repeat visitors spent less while first-time visitors tend to spend more (Oppermann 1996). Another finding by Jang et al. (2003) shows that business travelers spent a greater amount when compared to Visiting friends and relatives (VFR) travelers who stay longer and spend less by staying with relatives.

2.4.3. Psychographic Determinants

Research has shown that demographic, socio-economic attributes and trip-related characteristics are not the only determinants of vacation choices and travel expenditure. Tourists with similar demographic and socio-economic attributes may choose different destinations as well as differences in their travel expenditure due to psychographic variables such as life cycle stage (Hong et al. 2005); and the presence of children and homeownership or tenure (Alegre et al. 2013). The use of psychographic variables in analyzing tourist behaviour and its contribution to destination choice and travel expenditures is increasingly appealing. According to Um and Crompton (1990), psychographic factors are important determinants of destination choice, mode of travel, choice of tourism activities participated in and travel expenditure pattern.

Gitelson and Crompton (1984) compared consumer choice between pleasure travel and retail store purchase and found that: vacation is an expensive product, and consumers pride in more expensive tourist package making them spend more time on deliberation and over-search activity; destination decisions are not spontaneous and tourist expenditures are anticipated, planned and saved for; and unlike in most retail store purchase decision, a buyer is informed of the existence, availability or usefulness of a brand by both the physical product itself and in symbolic ways,

through promotional communication whereas selecting pleasure travel is not so, the individual obtains the important information independently.

Plog (2002) examined the predictive power of 'venturesomeness' in contrast to household income. The author found that high-income earner has more money to spend, venturers diverge by not taking expensive trips. Thus, income may do a better job of predicting spending while on a trip, but psychographics may do a better job of predicting the total number of trips and the kind of activities people engage in while travelling. In conclusion, using both income and venturesomeness together increases the predictive power for leisure travel.

Despite the volume of literature on the determinants of tourism expenditure, the role of tourism taxes in both tourist participation and spending decisions is yet to be examined. Consequently, this doctoral thesis set out to achieve this and contribute to the knowledge of tourist behaviour.

2.5. The role of tour operators and travel agents

In the micro and macro level analysis of tourism demand, it is vital to highlight the role of tour operators such as travel agents and on-line travel firms. Tour operators drive the expectations of tourists and highlight every detail of a trip with a great understanding of specific tourism products and services tailored to the needs of their clients (Buckley and Mossaz 2016). This is because the demand for and spending on tourism services by tourists is influenced by activities of large tour operators as well as their relative bargaining power. According to Carey et al. (1997), tour operators are important determinants of how sustainable tourism services can be at a destination. In other words, they determine the nature of tourism demand as well as how much supply can be available at a tourist destination over time. Hence, policies that affect tourism services such as taxation, will require an understanding of what operational and marketing strategies exists at a destination and how these influences the sustainability of the destination.

Furthermore, while the activities of tour operators can determine the nature of tourism product and services, the role of tourism firms who act as suppliers of tourism products and services is also vital. For instance, in the case of availability of hotel room for tourists, travel agents and similar tour operators are central to the

effectiveness of these hotels. Romero et al. (2020) found a direct relationship between reliance on tour operators and hotel services. Specifically, while hotels are likely to employ and sell more, their profitability is negatively affected (Romero et al. 2020). This suggest that tour operators have a potential to put pressure on the services provided by hotels particular at destinations located in coastal areas.

Additionally, one of the channels via which tour operators exert influence in the tourism industry rests in their bargaining power. Bargaining theory is a branch of game theory which deals with bargaining problems, whereby two or more parties to a transaction bargain over the division of certain goods. A bargaining problem is, however, solved only when such division problem is determined. Also, the theory of bargaining generally refers to the ability of individuals, through their associations, arrange contracts to decide their terms of business. Such bargaining can be distributive, integrative, productivity, composite or concessionary in form. However, in providing tourism services, when the bargaining powers of tour operators are considered, price paid can be influenced and this affects the level of demand for and expenditure on tourism services. In a perfectly competitive market or an evenly matched monopoly, there may be an equal power of bargaining across board. However, depending on how segmented the market is, as well as the nature and type of destination, bargaining power may shift significantly from tourism firms such as hotels, to tour operators (Lee et al. 2013). Such bargaining power may, however, be weakened if tourists perceive services of tour operators to be below expectations (Vladimirov 2012).

2.6. Conclusion

Amongst the macro determinants of tourism demand, population, income (or GDP, GNP, or per capita income), relative price, exchange rate, weather, cost of living, and other dummy variables is commonly used. In recent times, however, new findings show that mood and sentiment (Dragouni et al. 2016), terrorist incidents (Samitas et al. 2018), low-cost carriers, emissions, and climate change policies (Alsumairi and Hong Tsui 2017, Damm et al. 2017, Koo et al. 2017, Matthew et al. 2017, Boonekamp et al. 2018, Dube and Nhamo 2018, Wang et al. 2018, Wu et al. 2018), are important determinants of tourism demand. New directions also exist for

the impact of macroeconomic variables on tourism demand (Dogru et al. 2017a, Martins et al. 2017).

Giving the volume of research on the macro determinants of tourism demand, the need to investigate more thoroughly the link between consumer choice, tourist expenditure and tourism taxation at the level of microeconomics cannot be overemphasized. As Alegre and Pou (2014) stated, theoretical economic models at a micro-level can be investigated, and still maintain consumer preference as regards components of holiday expenditure. Also, researching at a micro-level is relatable to theoretical economic consumer models, and reserves the freedom of choice for individuals not to expend money for tourism services. Research into tourist behaviour at a micro level also offers a wide and in-depth study of individual consumer behaviour.

More importantly, micro-level analysis of consumer behaviour is made possible through the availability of rich data which offers individual-based expenditure of tourists while also outlining tourist demographic, social and economic features which further assists the researcher in profiling his analysis (Belenkiy and Riker 2013). As a result, economists have helped developed the theoretical basis for analysing consumer behaviour in tourism, as well as the use of advanced research methods (Song et al. 2012). Thus, this study aims to empirically examine the impact of tourism taxes on tourist expenditure and international tourist arrivals.

Chapter Three. A review of the literature on Tourism Taxation

3.1. Introduction

The taxation of tourism is a debatable and interesting issue. While some justify the levying of tourism taxes, others discourage its use. For the former, the tourism industry has grown to become a key industry used by developing countries to generate income, employment, foreign exchange, and tax revenues (Mak, 2006). Thus, since tourism needs to use goods and services produced by different sectors highly inter-related among them as agriculture (i.e., food and beverages), manufacturing (i.e., handicraft and souvenirs in general), and services (i.e. transportation and communication), taxing tourism is considerable. Moreover, the production of tourism goods and services require the use of resources that may have to be diverted from other economic uses (Mak, 2006). This inevitably imposes extra costs on governments that need to provide and maintain the necessary tourism infrastructure to sustain the economic benefits from the industry. These costs are arguably covered by residents but can be shifted through revenue generated from tourism taxes.

Tourism taxation has also been argued against on the basis that it adversely affect the national economy by slowing down growth rates and reducing the potential for creating and sustaining employment (Manente and Zanette 2010, Dwyer, Forsyth, and Spurr 2012, Arguea and Hawkins 2015). Also, by levying tourism taxes, small island economies suffer from inefficiency and a trade-off between tourism and other sectors (Sinclair et al. 2005). Hence, policy options are limited and must be chosen carefully, given that tourism is the driver of such economies. Furthermore, in the case of tourism-dependent countries, a convenient and arguably efficient way to generate revenue may be to impose tourism taxes, given its diverse effects on tourism exports, domestic tourism, and other sectors in the economy (Gooroochurn and Milner 2005). However, this has a negative impact in cases where the destination has lower market power e.g. volume of international tourist arrivals is lower and has many competitors with similar destination characteristics (Sheng and Tsui 2009) or the share of tourism demand component of a commodity consumed by domestic residents is higher than those consumed by tourists (Gooroochurn 2009).

Also, early studies on tourism taxation were on bed taxes (Combs and Elledge 1979, Weston 1983). However, with concerns about the environment across the globe, tourism taxes such as air travel tax, carbon tax, green tax have been studied more recently (Falk and Hagsten 2018, Zhang and Zhang 2018, Song, Seetaram, et al. 2019). The findings from these studies and others are synthesized in the current study. The motivation behind this is to survey ongoing advancement in tourism taxation research. The paper outlines the present state of knowledge and makes comprehension of the subject for the reader by discussing the findings reported in past research papers. Thus, the major contributions of this paper are summarized into three parts. First, to the best of our knowledge, this study is a foremost attempt to review the types of tourism tax levied on tourism activities and their impact. Secondly, since different tourism tax research address different research focuses, and in some cases adopt distinctive data characteristics and require diverse analytic techniques, a systematic analysis for each tourism tax type is conducted. This is done from the perspectives of research focuses, data characteristics, analytic techniques, and research suggestions. Finally, challenges and prospects are examined.

The remaining part of this chapter is organized as follows. Section 3.2 presents the general findings (or statistics) of the reviewed literature, as well as the analytical framework of this paper. By following this framework, sections 3.3, 3.4 and 3.5 investigate the different tourism taxes, i.e., general tourism tax; accommodation tax; and environmental tax, respectively. Section 3.6 discusses the main findings of the chapter, points out further directions in tourism tax research, and concludes the chapter.

3.2. General findings

3.2.1. Databases

The specific information on the articles utilized for the review in this section is summarized in table 3.1. Column 5 of Table 3.1 shows articles that recommend an introduction or increase in tourism tax; a decrease or elimination; or both. It also shows articles that make no recommendation about tourism tax. The mix of research suggestions highlights the lack of consistency of research findings of the effect of tourism taxes, which is discussed in more detail in subsequent sections throughout the review. Also, the emphasis is placed on articles that focus on any or

all the following: investigates the appropriate form of tourism tax (lumpsum or per-unit); investigates the use (to correct externality or to generate revenue); or models the estimated impact.

Table 3.1. Summary of research on tourism taxation

	Legend	
3. Kind of Tax **AT: Accommodation tax (which is also referred to as Occupancy Tax; Hotel tax; or Bed tax)** **GTT: General taxation of tourism** **ET: Environmental Taxes** **VAT: Value Added Tax** **ATT: Air Transport Tax** **Casino Tax** **APD: Air Passenger Duties** **GST: General Sales Tax** **CT: Carbon Tax** **TT: Transport Tax** **CIT: Company Income Tax** **CT: Carbon tax** **AC: Aviation charge** **AT: Airport tax** **FT: Fuel tax** **ETS: Emissions trading scheme** **PMC: Passenger movement charge**	**4. Method of Analysis** ADLM: Autoregressive Distributed Lag Model ARIMA: Autoregressive Integrated Moving Average CGE: Computable General Equilibrium Model CHAID: Chi-square Automatic Interaction Detector CVM: Contingent Valuation Method DA: Descriptive Analysis DID: Difference in Differences DSGE: Dynamic stochastic general equilibrium DEA: Data Envelope Analysis OLS: Ordinary Least Square PDM: Panel Data Methods of Fixed Effects and Random Effects CDM: Count Data Models used by Palmer-Tous et al. (2007) - the truncated Poisson (TP), zero-truncated negative binomial (TNB), simple Poisson (P), negative binomial (NB), zero-inflated Poisson (ZIP) and zero-inflated negative binomial (ZINB) models. SR: Stepwise Regression SUR: Seemingly Unrelated regressions SCM: Synthetic Control Method	**5. Research suggestion** ↑→ Increase or introduce a tourism tax ↓→ Decrease or eliminate tourism tax ↑ or ↓→ mixed

S/N	1. Study	2. Research focus	3. Kind of tax	4. Method of analysis	5. Suggestion
1	(Combs and Elledge 1979)	To Provide policy guidance to hotel operators to problems regarding Hotel room taxation.	AT	OLS	↑
2	(Hughes 1981)	A tourism tax: The cases for and against	AT	Theoretical	↑
3	(Fish 1982)	Taxing international tourism in West Africa	AT	Theoretical	↓

4	(Weston 1983)	To examine the case for the imposition and ubiquity of room taxes.	AT	Theoretical	None
5	(Fujii et al. 1985)	The exportability of hotel occupancy and other tourist taxes	AT	OLS	↓
6	(Mak 1988)	Examining the extent to which hotel operators can pass on taxes to hotel users.	AT	Theoretical	None
7	(Spengler and Uysal 1989)	Considering hotel taxation by providing a framework of elements considered important by tax experts and hospitality specialists.	AT	Theoretical	None
8	(Copeland 1991)	Using a general equilibrium international trade model to investigate how the expansion of tourism affects welfare, output and factor prices.	GTT	Simulation	↑
9	(Bonham et al. 1992)	Analysing time series before and after the imposition of a tax to estimate the Impact of a hotel room tax on the real net hotel revenues.	AT	ARIMA	↑
10	(Hiemstra and Ismail 1992)	A summary of the Impacts of room taxes on the lodging Industry	AT	OLS	↓
11	(Bird 1992)	Proffering solution to effective taxation in the tourism industry for developing countries.	GTT	Theoretical	↑
12	(Hiemstra and Ismail 1993)	Revising the paper “Incidence of the impacts of room taxes on the lodging industry” published in 1993.	AT	OLS	↑ or ↓
13	(Abeyratne 1993)	To Clearly define the term tax and charge and solutions to the perceived discriminatory nature of tourism taxation in the USA which requires foreigners to bear the cost of promoting tourism in the USA.	ATT	Theoretical	↓
14	(Clarke and Ng 1993)	Providing a theoretical framework based on economics for assessing tourists’ costs and benefits.	GTT	Theoretical	↑
15	(Wanhill 1995)	Revising and Summarizing the issues raised by the British Tourists Authority (BTA).	VAT	Theoretical	↓
16	(Bonham and Gangnes 1996)	Analysing the effect of Hawaii room taxes on hotel revenues using time-series intervention analysis.	AT	Cointegration	↑
17	(Dwyer and Forsyth 1999)	Examining bed tax in Sydney; its scope, nature and effects of the tax.	AT	DA	↓
18	(Nevin 1999)	Assessing the credibility of British tourism policy.	VAT& APD	DA	↓
19	(Hiemstra and Ismail 2001)	Revision to an article published in spring 1993 issue of JTR on "the incidence of the impacts of room taxes on the lodging industry":	AT	OLS	None
20	(Forsyth and Dwyer 2002)	Assessing how market power affects the taxation of domestic and international tourism.	GST	Theoretical	None

21	(Jensen and Wanhill 2002)	Reviewing on which principles by which tourism should be taxed focusing on the different VAT in Europe and Denmark.	VAT	Simulation	↓
22	(Palmer and Riera 2003)	Confirming the existence of external environmental costs of tourism; economic, social, cultural and environmental repercussions of tourism and the need to internalise them.	ET	Theoretical	↓
23	(Dimanche 2003)	Analysing the Louisiana Tax-Free Shopping Program in the United States.	VAT	DA	↓
24	(Gooroochurn and Sinclair 2005)	Presenting the Types, Objectives, principles and effects of tourism taxation	GTT	CGE	↑
25	(Gooroochurn and Milner 2005)	Investigating the effects of the reform of the current structure of indirect taxes in Mauritius which is a relatively tourism-dependent economy.	VAT	CGE	↑
26	(Aguiló, Riera, et al. 2005)	Analysing the short-term price effect of a tourist tax through a dynamic demand model. The case of the Balearic Islands	AT	SUR	None
27	(Aguiló, Alegre, et al. 2005)	Analysing the Balearic tourism markets i.e. a market for the sun and sand tourism.	ET	SUR	↓
28	(Gössling et al. 2005)	The eco-efficiency of tourism	ET	DS	None
29	(Ihalanayake and Divisekera 2006)	The tourism tax burden on Australia	GTT	DA	None
30	(Litvin et al. 2006)	Providing ways in which small communities and countries across the state of South Carolina may use return on accommodation tax revenue.	AT	Exploratory analysis	↑ or ↓
31	(Pintassilgo and João Albino 2007)	Considering the interaction between the tourism accommodation industry and environmental quality.	AT	Theoretical	↑
32	(Palmer-Tous et al. 2007)	Taxing tourism: The case of rentals cars in Mallorca	ET	SD	↑ or ↓
33	(Mayor and Tol 2007)	Estimating the impact of the recent and proposed changes in the Air Passenger Duty (APD) of the United Kingdom.	APD	Simulations	↓
34	(Tol 2007)	Estimating the impact of a carbon tax on international tourism	ET	Simulations	↓
35	(Mak 2008)	Analysing how tourist tax might influence consumer behaviour using a simple model which treats the cruise ship passenger tax as a lump-sum tax.	VAT	Theoretical	↑

36	(Benar and Jenkins 2008)	Analysing four alternative forms of regulatory and taxation policies and examining the interactions between these two sets of investments	Casino Tax	Theoretical	↑
37	(Gooroochurn and Sinclair 2008)	Investigating the welfare effect of Commodity taxation on the presence of tourists.	VAT	Simulation	↑
38	(Durbarry 2008)	Understanding the implications of tourism taxes by modelling inbound tourism demand in the UK.	VAT	PDM	↓
39	(Gómez-Lobo and González 2008)	The use of airport charges for funding general expenditures: The case of Chile	AC	DEA	↓
40	(Gooroochurn 2009)	Extending the Ramsey model to include tourism and providing a theoretical analysis of the efficiency, equity and disincentive of work effects of commodity taxation in the presence of tourists.	VAT	Theoretical	↑ or ↓
41	(Sheng and Tsui 2009)	Using a modified simple general equilibrium model of international trade to determine if taxing tourism may increase or decrease economic benefit.	GTT	Theoretical	↑
42	(Gago et al. 2009)	Determining whether the introduction or increase of tourism taxation should be done through specific or general indirect taxation in Spain.	GTT	CGE	↑
43	(Brida and Pereyra 2009)	To present a model of vertical differentiation in the accommodation industry where differentiation is associated with quality	ET	Theoretical	↑ or ↓
44	(Beladi et al. 2009)	To examine the effects of pollution taxes on welfare and environment for a small open economy.	ET	Simulation	↑
45	(Rey-Maquieira et al. 2009)	Quality standards versus taxation in a dynamic environmental model of a tourism economy	AT	Theoretical	↓
46	(Schubert 2010)	Using a simple dynamic model of a small open economy to study optimal taxation.	GTT	Theoretical	↑ or ↓
47	(Manente and Zanette 2010)	Testing the effects of a fiscal measure aimed at lowering the Vat rate from 10% to 5% in the Italian hotels and restaurant sectors on the Italian economy.	VAT	Simulation	↓
48	(Mayor and Tol 2010)	Analysing the impact of European climate change regulations on international tourist markets	ETS	Sensitivity Analysis	↑ or ↓
49	(Logar 2010)	Sustainable tourism management in Crikvenica, Croatia: An assessment of policy instruments	ET	DA	↑ or ↓
50	(Burns 2010)	To determine the demands on local authorities for funding tourism, considering their views on tourism taxes.	GTT	DS	↑ or ↓

51	(Chang et al. 2011)	To Develop a dynamic optimising macro model that clearly explains the congestion externalities caused by tourism expansion and the wealth effect generated by the revenues from overseas tourism taxation; (two tourism stylised facts)	ET	Theoretical	↑
52	(Kato et al. 2011)	Evaluating the merits of Kauai County's use of the property tax to capture rents from tourism.	AT	DS	↓
53	(Sheng 2011)	Modelling the impact of combined policy tool based on taxing tourism and subsidizing non-tourism in a tourism-dependent destination using a combined analysis of general equilibrium and a partial equilibrium.	GTT	Theoretical	↑ or ↓
54	(Josep et al. 2012)	Arguments in favour of taxing tourism: The Lanzarote case study	GTT	Theoretical	None
55	(Ihalanayake 2012)	Analysing the economic effects of tourism tax changes in Australia.	GTT	CGE (Static)	↓
56	(Vjekoslav et al. 2012)	Determining the connection and mutual causality of the tax and hidden tax burden and their influence on the development of the tourism sector and its competitiveness in Croatia.	CIT & VAT	Theoretical	None
57	(Do Valle et al. 2012)	Determining tourists' attitudes towards an accommodation tax earmarked for environmental protection in the Algarve.	AT	CHAID	↓
58	(Aguiló et al. 2012)	Analysing tourism associated externalities by analysing tourism demand profiles.	TT	OLS	↑
59	(Dwyer, Forsyth, and Spurr 2012)	Estimating the potential economic effects of the economy-wide carbon tax to be introduced in July 2012, on the Australian tourism industry.	CT	CGE	↑ or ↓
60	(Russu 2012)	To analyse a model describing the interaction between tourists and environmental resource in the presence and absence of tax used to protect the environmental resource.	ET	Theoretical	None
61	(Schubert et al. 2012)	To make additional Contribution to A general equilibrium analysis of Casino taxation in Portugal.	Casino Tax	Simulations	↓
62	(Blanc and Winchester 2012)	Analysing the impact of the additional costs imposed on airlines by European Union Emissions Trading System on tourist arrival in 26 Caribbean states.	ETS	PDM	↓
63	(Dwyer, Forsyth, Spurr, et al. 2012)	Assessing the potential economic effects, the introduction of a carbon tax on the Australian tourism industry.	CT	CGE	↓
64	(Lejárraga and Walkenhorst 2013)	Economic policy, tourism trade and productive diversification	GTT	SR	↑ or ↓

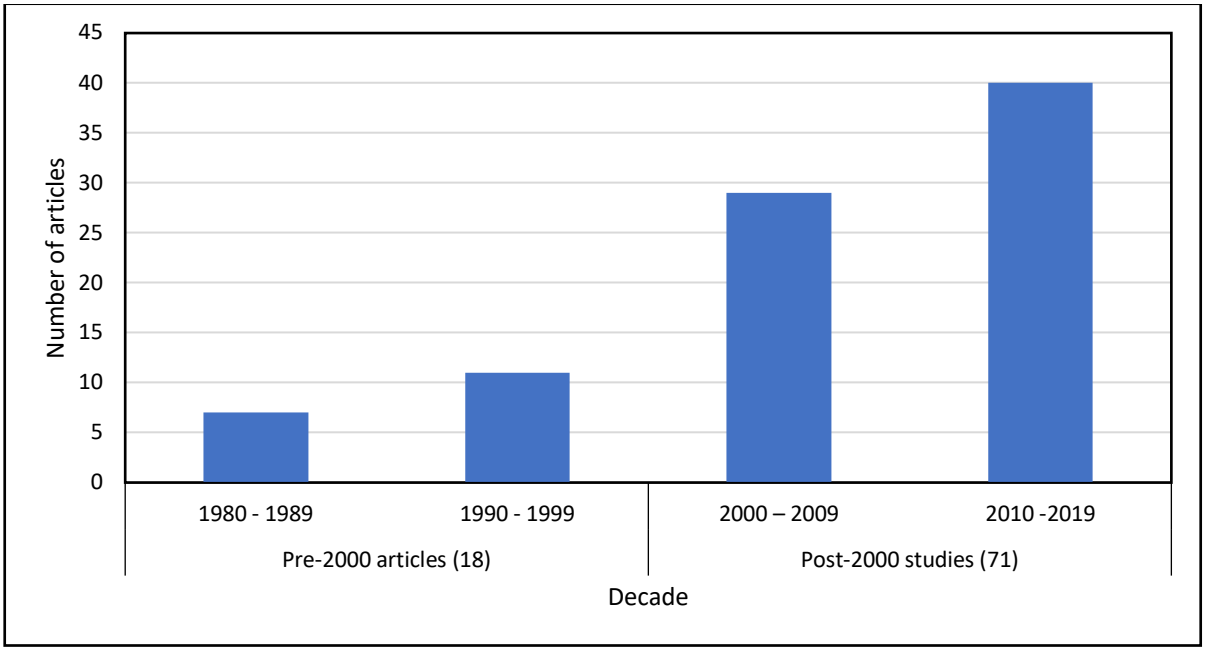
65	(Bakhat and Rosselló 2013)	Estimating the monthly aggregate demand for diesel oil and gasoline in a mass tourism region known for a high level of seasonality.	FT	OLS	↑ or ↓
66	(Cetin 2014)	To Investigate how Istanbul, sustain its tourism development through city tax.	VAT	Theoretical	None
67	(Lee 2014)	Examining the effect of bed tax on hotel performance in the midland Odessa lodging market.	AT	PDM	↓
68	(Forsyth et al. 2014)	Estimating the flow and expenditure effects of the recent increase in Australia's passenger movement charge (PMC) as well as economic impacts on the Tourism industry and Australian Economy as a whole.	PMC	CGE	↑ or ↓
69	(Seetaram et al. 2014)	To examine the effects of air passenger duty on UK outbound tourism demand for ten international destinations.	APD	ADLM	↓
70	(Mak 2015)	Investigating whether local hotel taxes in Hawaii are fully passed on to hotel guests as lawmakers had intended.	AT	DA	↑ or ↓
71	(Candela et al. 2015)	Investigating the effects of Keynesian policy in tourism destinations where tourism products are sold through direct sales.	AT	Theoretical	↑
72	(Arguea and Hawkins 2015)	Estimating the elasticity of a local tax base concerning the rate of Florida counties with rate changes between 1998 to 2012.	AT	ARIMA	↓
73	(Afonso 2016)	Estimating differences between urban, suburban and rural counties and the impact of the proximity of urban. Also, the impact of Local options sales taxes (LOSTS) decisions on tourism rich counties.	GST	PDM	↓
74	(Ponjan and Thirawat 2016)	Examining Thailand's tourism tax cut policy aimed at alleviating negative impacts arising from the 2011 flood on the tourism industry and economy.	GTT	CGE (Dynamic)	↓
75	(Mahangila and Anderson 2017)	Investigating the tax administration burden in the tourism sector in the Zanzibar Islands.	GTT	DS	↑ or ↓
76	(Biagi et al. 2017)	To show how the imposition of a city tax affect domestic and international tourism demand	AT	SCM	↓
77	(Mahadevan et al. 2017)	Highlighting the impacts of poverty, income inequality and the macroeconomic and sectorial output resulting from an increase in the value-added tax and sales tax on hotels and restaurants.	GTT	CGE	↓
78	(Álvarez-Albelo et al. 2017)	Air passenger duties as strategic tourism taxation	APD	Theoretical	↑ or ↓

79	(Garsous et al. 2017)	Analysing a program of financial incentives introduced by the Brazilian government in the SUDENE area in 2002.	GTT	DID	↓
80	(Meng and Pham 2017)	Analysing the economic and environmental impact of Australian carbon tax with an emphasis on the tourism industry.	ET	CGE (Static)	↓
81	(Sheng 2017)	Theoretically illustrating that tourism economies differ substantially to market conditions which have a clear effect on the distribution of tax burden.	GTT	Theoretical	↑ or ↓
82	(Zhang and Zhang 2018)	Presenting a study of the changes in carbon emissions and economic welfare which could be brought about through a carbon tax policy in china's tourism industry.	ET	CGE	↓
83	(Falk and Hagsten 2018)	Investigating the short-run impact of the flight departure tax introduced in Germany and Austria in 2011.	ET	DID	↑
84	(Seetaram et al. 2018)	Estimating UK outbound travellers' willingness to pay air passenger duty levied by the government.	APD	CVM	↑ or ↓
85	(Zhang and Yang 2018)	Investigate the effects of external inbound tourism booms on the national economic account of a small open economy. (Dutch)	GTT	DSGE	↑
86	(Song, Seetaram, et al. 2019)	Modelling the influence of the air passenger duty (APD) on the budget allocations of outbound tourists.	APD	SUR	None

3.2.2. Descriptive statistical analysis

The number of published articles on tourism taxation is shown in figure 3.1. As it is observable, from 1979 to 2000, research on tourism taxation was still at an early stage with only a small number of publications but became increasingly popular from 2000 to date. Interestingly, this increase happened together with the growth of tourism industry as well as with the introduction of a carbon tax in many parts of Europe and Australia, suggesting that these factors played an important role in raising the interest of Academia towards this research topic. Tourism taxation research has been mainly published in tourism-related journals accounting for 69% of the total number of articles. However, due to its multidisciplinary nature, a reasonable number of articles have also been published in journals focusing on energy, transport, and public finance. For instance, due to the rise of emissions and climate change issues, research in tourism taxation has been published in journals such as Energy Economics; Ecological Economics; Journal of Air Transport Management; and Transportation Research.

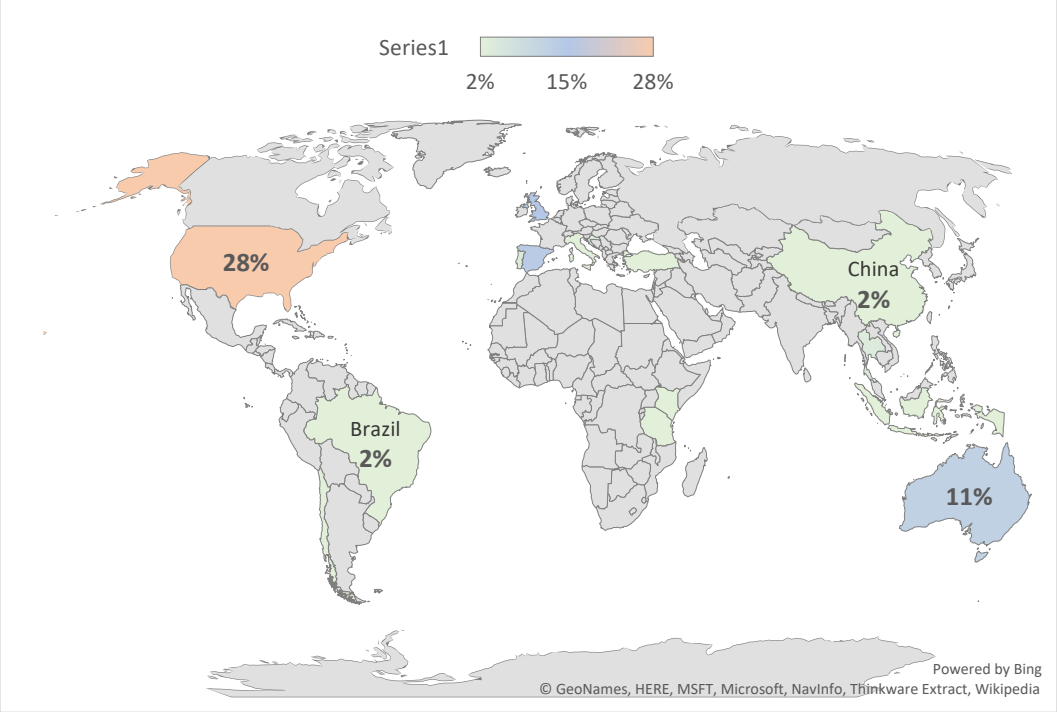
Figure 3.1. Distribution of the published decade



Source: Author

In terms of regions studied, research in tourism taxation have been conducted for just 18 countries and the regions of Europe, North America and Australia made the most contributions to estimating the impact of tourism taxation as shown in figure 3.2. The US is the country which presents the highest number of articles because it has been one of the first countries to introduce occupancy rates and this caught the attention of academics. The adoption of air passenger duties made the UK the second most studied country, followed by Spain and Australia.

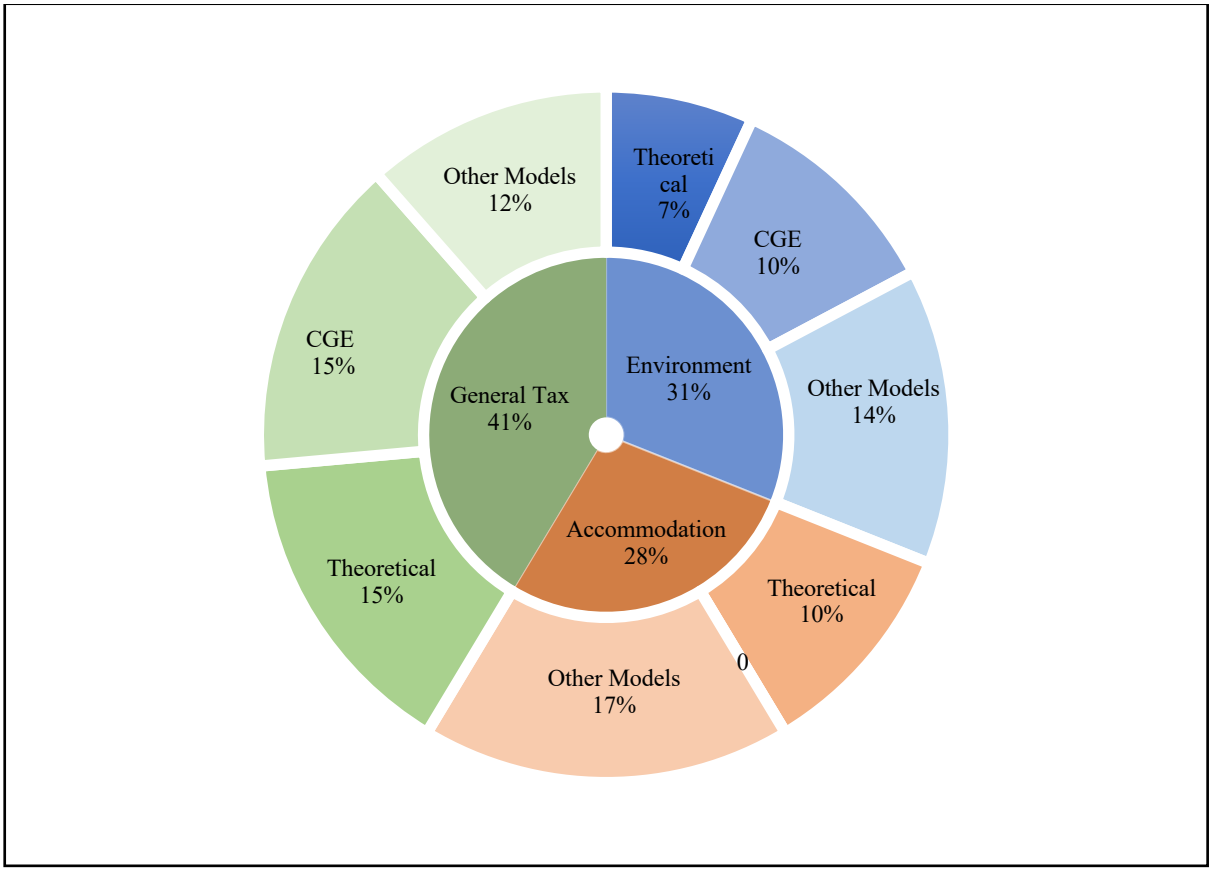
Figure 3.2. Coverage of research region



Source: Author

In the literature, the kinds of tourism tax is presented (fig. 3.3): the general tax on tourism services (which includes general sales tax and value-added tax); accommodation taxes; and environmental taxes (including transport tax, air passenger duties, and carbon tax). Figure 3.3 also shows the percentage of research that was empirical or theoretical. Both theoretical and empirical analysis have been performed. However, among the latest studies, there is a huge disparity in the models used according to the kind of tourism tax analysed and in some cases, empirical analysis is limited to data availability. Specifically, theoretical studies have been mainly conducted to analyse both accommodation and general tax, while the success of CGE models to study both general and environment taxes, is ascribed to the increasing availability of data from climate change researches. It is worthy of note that there is not much evidence of a study which has adopted the CGE model to investigate the accommodation tax.

Figure 3.3. Distribution of tourism tax investigated, and methodology used



Source: Author

The growth of research on tourism taxation has offered an understanding of the theoretical foundation for the analysis of the impact of tourism tax on consumers, firms, and the government. The basic consumer theory has been adopted for tourism demand analysis which affords researchers the ability to measure utility and estimate price elasticities for consumer demand; monopolistic competition and game-theoretical models for firms; and several macroeconomic models for the government. These include the application of the optimal tax theory; Ramsey model; composite common pool resource; the Hartwick rule; and the Ricardian equivalence which have been adopted in empirical studies on tourism taxation.

3.3. General taxation on tourism

General tourism taxes (GTTs) are direct and indirect taxes levied on several tourism services. Direct tourism taxes are levied on the income of providers of tourism services and products, while indirect tourism taxes are mainly in the form of sales tax or value-added taxes (VAT) for specific service/good. Research on direct tourism tax is limited when compared to indirect taxation of tourism services. The

commonly studied taxes lie in the areas where tourists spend the most i.e. when paying for tourism goods and services such as betting services/casino, cruise services and a visit to tourist attractions. Previous studies have been conducted to account for the impact of relative value-added taxes on some specific tourist activities. Thus, in table 3.2, a schematic summary of published articles is presented to guide the discussions in this section. The articles are distinguished according to nature, i.e. theoretical or empirical, the kind of econometric models used, and the policy implications suggested by the authors.

Table 3.2. Studies on tourism taxation in general.

Research/Study	**Nature**			**Empirical model**		**Suggestion**	
	Theoretical	**Empirical**		**CGE**	**Other**	**Increase / Introduce**	**Decrease / Eliminate**
		Case study	**Simulation**				
Copeland (1991)			x			x	
Bird (1992)	x					x	
Clarke and Ng (1993)	x					x	
Wanhill (1995)	x				x		x
Nevin (1999)		x					x
Jensen and Wanhill (2002)	x	x	x		x		x
Forsyth and Dwyer (2002)	x					no recommendations	
Dimanche (2003)		x			x		x
Gooroochurn and Milner (2005)		x		x		x	
Gooroochurn and Sinclair (2005)		x	x	x		x	
Ihalanayake and Divisekera (2006)	x	x				mixed effect	
Durbarry (2008)		x			x		x
Mak (2008)	x				x	x	
Gooroochurn and Sinclair (2008)	x		x			x	
Gooroochurn (2009)	x					x	
Sheng and Tsui (2009)	x					mixed effect	
Gago et al. (2009)		x		x		x	
Manente and Zanette (2010)		x			x		x
Schubert (2010)	x				x	mixed effect	
Burns (2010)		x			x	mixed effect	
Sheng (2011)	x				x	no recommendations	
Ihalanayake (2012)		x	x	x			x

Josep et al. (2012)	x					no recommendations	
Vjekoslav et al. (2012)	x	x				no recommendations	
Lejárraga and Walkenhorst (2013)		x			x	mixed effect	
Cetin (2014)	x	x				no recommendations	
Afonso (2016)		x			x		x
Ponjan and Thirawat (2016)		x		x			x
Mahadevan et al. (2017)		x		x			x
Garsous et al. (2017)		x			x		x
Sheng (2017)	x				x	mixed effect	
Mahangila and Anderson (2017)		x			x	mixed effect	
Zhang and Yang (2018)		x			x	x	

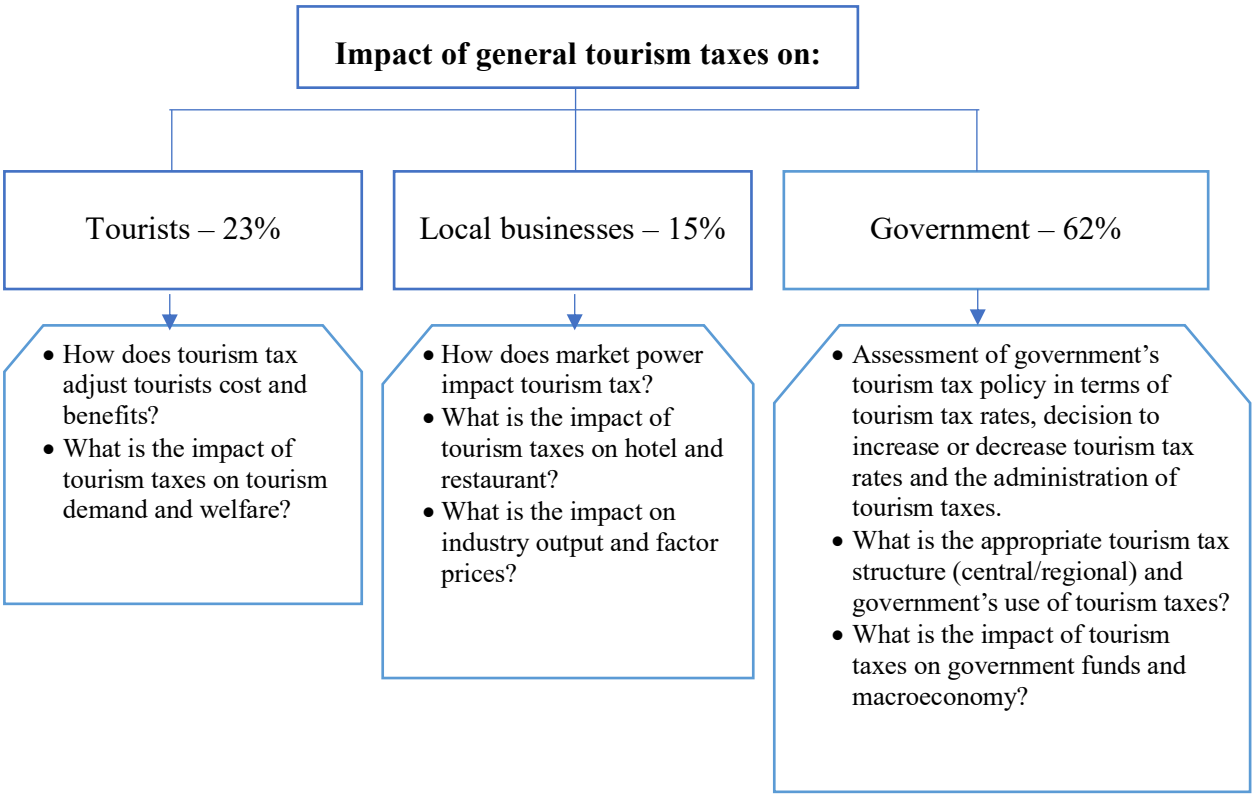
3.3.1. Research focuses

In tourism literature, the impact of general taxes (both direct and indirect) on tourists, local businesses, and the government have been studied. Figure. 3.4 schematically represents the main research questions that have been investigated so far which is grouped into three: research focusing on tourist behaviour; tourism businesses; and the government. The impact of tourist taxes on tourist behaviour has been studied partly to provide theoretical underpinnings based on an assessment of how taxes tend to adjust tourists' costs and benefits. The focus of such analysis also extends to measure changes in tourism demand and welfare. As for the nature of the general tax, VAT on tourism services were mostly studied except for specific taxes on casino (Benar and Jenkins 2008). Additionally, for specific tourism services, tourism tax is levied per head. For example, in the case of passengers boarding cruise ships (Mak 2008). A benefit of studying these specific tourism taxes is to provide insightful implications for the tourism industry in terms of efficiency, equity and disincentive of tourism businesses (Gooroochurn 2009).

Research showing the macroeconomic impact of tourism taxes mainly address economy-wide effects. This includes impact on trade balance (Copeland 1991, Sheng and Tsui 2009, Lejárraga and Walkenhorst 2013); poverty and income distribution (Mahadevan et al. 2017). However, due to the important amount of revenue coming from VAT, research in this area has mainly focused on: government's motivation for increasing VAT on tourism services (Jensen and Wanhill 2002) and the optimal amount to levy (Gooroochurn 2009, Schubert 2010);

approaches for the introduction of tourism taxes either specific or general (Gago et al. 2009, Vjekoslav et al. 2012); the Dutch disease (Sheng 2011, Zhang and Yang 2018) and externalities (Schubert 2010).

Figure 3.4. Categorization of the research focus of studies on general (direct and indirect) tourism tax



Source: Author

3.3.2. Data characteristics

Data used in empirical studies on general taxation of tourism have been conducted using database drawn from different sources. Studies mainly make use of country-specific data derived from social accounting matrix and taxes paid by corporate, labour, sales, property, production, import duties, and export. For instance, to study the efficiency and equity effects of the tourism taxation system in Mauritius, Gooroochurn and Milner (2005) and Gooroochurn and Sinclair (2005), using a social accounting matrix for the year 1997. In the research conducted by Ihalanayake and Divisekera (2006) and Ihalanayake (2012), Australian tourism taxation system has been analysed using the Taxation Statistics of the Australian Taxation Office (ATO) data for the year 1992 to 2002 and a tourism tax model database respectively.

Cross-section data of 151 countries for the year 2004 have been used by Lejárraga and Walkenhorst (2013). Wanhill (1995) carried out a sensitivity analysis in the UK using data collected through two ad-hoc surveys focusing on supply-side (UK tourism operators) and on the demand side (residents) respectively. Panel data have been less often used in tourism taxation literature. However, recently, Afonso (2016) and Garsous et al. (2017) used this kind of data for 100 North Carolina counties from 2003 to 2009, and 617 municipalities from 2002 to 2009 respectively. Also, using panel data for EU countries from 1990 to 1994, Nevin (1999) showed that the rate of VAT on accommodation is negatively correlated with the rate of growth of the international tourism receipts, and this means that the higher the VAT rate the lower the growth of tourism revenues. In other words, the accommodation sector is highly price-sensitive, and a high tax rate can lead international tourists to switch towards more affordable tourism destinations, with a consequent loss of competitiveness of the tourism industry.

3.3.3. Kind of research and research suggestions

As shown in table 3.2, empirical studies have been mainly conducted to study general tourism taxation. For ease of comparison, this study differentiates empirical studies that adopt general equilibrium models from those that adopt partial equilibrium models. General equilibrium models synthesize all sectors of the economy into one framework and present the impact of tourism tax changes on the economy. Partial equilibrium models, on the other hand, focuses on only one part of the economy, such as the consumer or producer. However, among the empirical models that have been adopted is the CGE model, which is a general equilibrium model that has been used quite frequently since the 2000s. Other partial equilibrium models include panel data models and time series models. It is nevertheless interesting to note that research suggestions differ significantly either with a similar technique or not, depending on the data used and the country or group of countries studied.

To start with, the CGE model is an approach to economic analysis that combines a general equilibrium setting with numerical simulations. This allows the analysis of a wide range of issues within a large variety of modelling structures (Blake, 2000). Due to their computational rigour and extensive analytical capability, several authors prefer to investigate the impact of government fiscal policies using CGE

models. Depending on the aim of the research, however, other authors prefer partial equilibrium models, as CGE models are limited in their ability to present analysis at a level of product aggregation or in terms of specific sector-wide impact analysis.

Among studies adopting a CGE model, two studies on Mauritius and one for Spain, both suggest the need to increase the tourism tax, while no assessment on the incidence of taxes was conducted. Although, Mauritius is a tourism-dependent country and increasing indirect taxes may seem efficient and equitable (Gooroochurn and Milner 2005, Gooroochurn and Sinclair 2005), the argument for introducing it in Spain is also plausible since it has a sizable tourism industry (Gago et al. 2009). On the contrary, Mahadevan et al. (2017) suggest a decrease in tourism tax, since increasing taxes leads to adverse macroeconomic impacts. Additionally, Ponjan and Thirawat (2016) suggest that decreasing it in times of natural disasters that affects the tourism industry can alleviate negative impacts. A reduction or an abolition of tourism taxes could be a significant incentive to the tourism sector that leads to an economic expansion attracting also investments from other industries (Ihalanayake 2012). However, as suggested by the author, this result has to be carefully considered since a static CGE model has been adopted and the use of a dynamic model is recommended.

Other forms of the general equilibrium framework have also been employed with numerical simulation. For instance, a simulated multiregional-multisectoral input-output model has been adopted to suggest a decrease in tax rates on hotels and restaurants in Italy (Manente and Zanette 2010). Similarly, through a simulation study, Jensen and Wanhill (2002) have been able to suggest a decrease in tax rates on hotels in Denmark. Finally, an increase in general taxation seems to increase resident welfare (Copeland 1991, Gooroochurn and Sinclair 2008).

Furthermore, in partial equilibrium analysis, the use of panel data models has become prominent. Popular panel data model estimation methods include fixed and random effects estimations; least squares dummy variables (LSDV); difference-in-differences; and two-stage and generalised least squares techniques.

Results from random and fixed effect estimations conducted by Durbarry (2008) stressed that high tax rates on tourism represent a competitive disadvantage for the tourism industry. This suggests that since tourism demand in the UK is highly price-sensitive, a combination of high tax rates and high external value of sterling

negatively affects tourism arrivals. Consequently, the tourism sector could benefit from a reduction in the tax rate in a measure by which tourists perceive this reduction as a price reduction.

Other panel technique (spatial Durbin error panel model and difference-in-differences) also suggests the need to reduce tourism tax since regions defer in their capacity to generate tourism revenue, a tourism tax design to accommodate this concern and equitability concerns is necessary (Afonso 2016). Also, intervening in the tourism sector through tax incentive boosts employment (Garsous et al. 2017).

3.3.4. Challenges and future directions

Although, recent progress in tourism tax research has stimulated a growing need to assess the economy-wide impact of general tourism taxes, yet there is still a substantial amount of room to expand and develop research on the impact and structure of this kind of tax. Some studies on general tourism taxation provide only theoretical discussions on how general tourism taxation should be modelled to account for welfare effects; tourism sustainability; and competitiveness of the destination. Also, some studies provide only descriptive analysis. The problem with this, however, is that the issues investigated (e.g., deterioration of British tourism as a result of tourism tax; or determining who bears tax burden) require further reassessments to support the conclusions of these studies and provide scientific evidence or justification upon which effective tourism policies can be made.

For studies that adopt panel data techniques, they seem to provide a unique conclusion which is a reduction or removal of tourism taxes is suggested because it diminishes tourist arrivals, reduces employment, and tax rates may differ significantly across regions.

There is an equal spread of support for and against tourism taxes. This may be due to some factors such as the complexity of the model adopted; the data and rigour in processing and analysing such data; differences in the construction of input-output tables (social accounting matrix); assumptions about different sectors; and conducting numerical simulation exercises. For instance, while studies using the CGE model to assess the same tourism tax in Mauritius suggest an increase, studies on the hotel sector in Europe using the CGE model suggest otherwise. Thus, considering the number of existing studies, it seems difficult to arrive at a consensus, consequently, more research is desirable. The datasets used in most

existing studies were also country-specific and assumptions about tourism tax were sector-specific which makes it problematic to generalize results.

For research focuses, revenue-generation impact and government's alignment with both equity and efficiency tax principles have been studied sufficiently. This also includes suggestions about the structure of indirect and direct taxes as well as trade impacts and tax as a remedy for the Dutch disease. However, evidence for consumer behaviour is worth a thorough study in the future (Do Valle et al. 2012). This, however, requires an effective analytic technique to properly capture tourist's perception of the destination as a result of tourism tax and choice behaviour.

3.4. Accommodation tax

Accommodation tax (AT) are charges levied on short-term occupancy by tourists. AT are lodging taxes, which is also referred to as occupancy tax, hotel tax, room tax, or bed tax and is added to the base price of the hotel room. They do not include long or short-term tenancy and can either vary among different local governments within a country or a unified occupancy tax rate is levied for the whole country. The tax base on which AT is levied can also vary per person and night or levied based on the room rate. In terms of AT rates, national (central) governments may differ significantly in how local governments levy the tax as well as how much they charge. In terms of use also, the local government in some countries exercise the rights to use the funds generated from AT to maintain and boost tourism in their region.

Much of the early-stage research on tourism taxation was on bed taxes, with more than half of publications in this group before 2000. This, therefore, has implications on the research focus; kind of model adopted; analytical techniques used; as well as research suggestions.

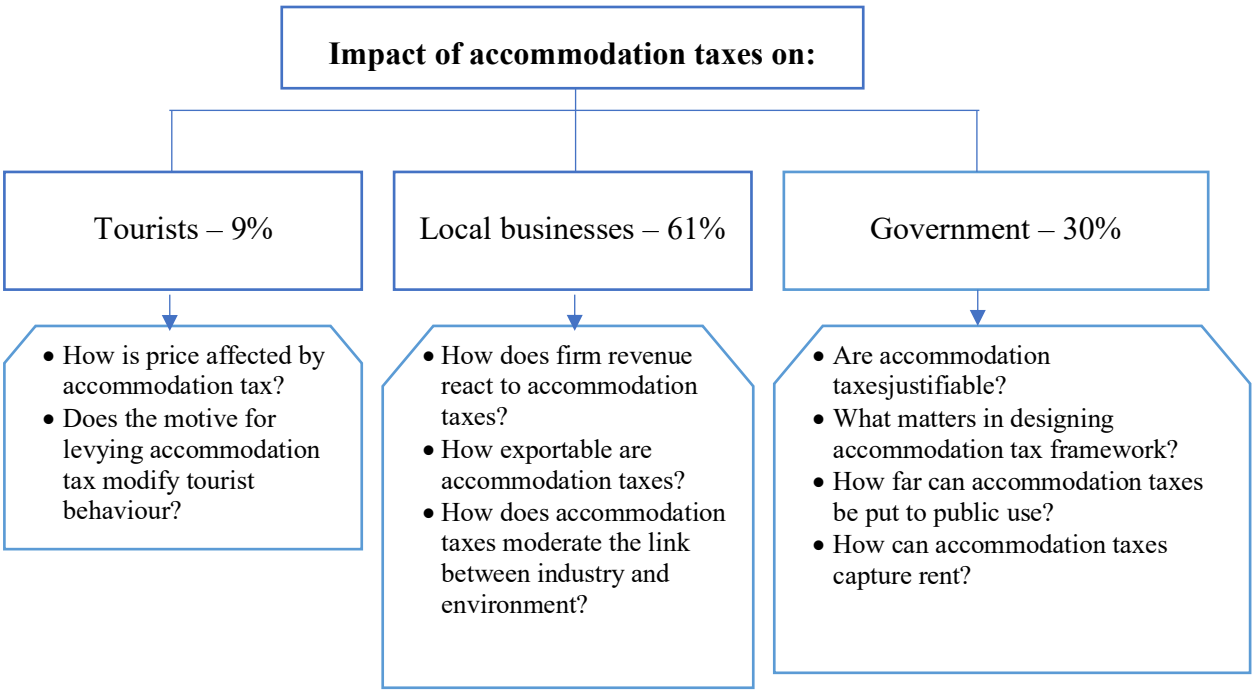
A distinctive feature of accommodation tax is that it is charged on tourist accommodation spending which is a major percentage of tourist budget. Consequently, revenue from accommodation tax is a source of government fund either for specific tourist projects aimed to improve the quality of both tourist activities and tourist experiences as a whole (Gago et al. 2009) or to develop and promote tourism services at the destination (Litvin et al. 2006). However, a direct link between accommodation taxes and tourism projects is often not visible (Gago et al. 2009, Cetin 2014). A distinctive disadvantage, nonetheless, is that these kinds

of taxes are continuously adopted by governments since they are considered a "free" revenue source (Litvin et al. 2006), as they indirectly affect businesses, or people with relatively high income who normally are non-residents, i.e. non-voters (Bonham et al. 1992, Hiemstra and Ismail 1992).

3.4.1. Research focuses

Generally, research on AT can be summarized and grouped into three main focuses as shown in figure3.5: tourist, local businesses, and the government. Only a limited number of studies on how AT influence tourists' behaviour have been found (group 1, fig. 3.5). In particular, Aguiló et al. (2005) studied the short-term price effect of AT, while Oom Do Valle et al. (2012) examined the attitude of tourists towards AT. Most of the early studies on AT focused on firms in the lodging industry, with emphasis on how their revenue is affected and the extent to which tax burden can be shifted on to the lodgers. This makes studies in group II account for more than 50% of studies on AT in the literature, the biggest being on the impact on hotel operators. In group III, research in AT extends to government structure, design and motive for levying AT (Dwyer and Forsyth 1999, Litvin et al. 2006, Kato et al. 2011).

Figure 3.5. Categorization of the research focus of studies on accommodation tax



Source: Author

3.4.2. Data characteristics

Time series data is the most used and is collected for each variable in the form of monthly, quarterly or annual data. A popular feature of time series data is ordering, and this poses several challenges in every series most of which can be overcome with appropriate econometric techniques. Examples of such challenges include trend; seasonality; outliers; long-run cycle; and constant variance.

Ad-hoc surveys have also been used to investigate tourist willingness to pay (WTP) for AT (Oom Do Valle et al. 2012). Such surveys include information on socio-demographic attributes, motivation and behavioural characteristics of tourists. These are all relevant features of survey data when used in tourism studies.

3.4.3. Kind of research and research suggestions

The percentage of empirical studies on the economic impact of the accommodation tax is up to 78% and are summarized in column 2 of Table 3.3. However, since many of the empirical studies utilize time series data, suitable time series econometric models have been employed due to the nature of the data.

In what follows, analysis is made based on recommendations from empirical studies on AT. Bonham et al. (1992) and Litvin et al. (2006) presented contradictory recommendations emerging from the empirical analysis of the impact of AT from Hawaii and South Carolina using similar time-series data. The former supports the imposition of AT from the analysis of change in the real net hotel rental receipts due to the introduction of the hotel room tax in 1987 showed no significant effect (Bonham et al. 1992). An implication of this is that the hotel room tax is quite fully a burden on tourists without any significant economic loss to hotel operators, although arguments remain that when the elasticities of demand and supply are considered, the incidence of tax may assume a clearer spread of the burden of tax. Litvin et al. (2006) on the other hand, caution the introduction of AT based on how the fund raised is spent by the government.

Table 3.3. Studies on accommodation taxes.

References	Nature		Empirical model		Suggestions	
			CGE	Other	Increase /Introduce	Decrease /Eliminate
	Theoretical	Empirical				
(Combs and Elledge 1979)		x		x	x	
(Hughes 1981)	x				x	
(Fish 1982)	x	x				x
(Weston 1983)	x				no recommendations	
(Fujii et al. 1985)		x		x		x
(Mak 1988)	x	x			no recommendations	
(Spengler and Uysal 1989)	x	x			no recommendations	
(Bonham et al. 1992)		x		x	x	
(Hiemstra and Ismail 1992, 1993, 2001)		x		x		x
(Bonham and Gangnes 1996)		x		x	x	
(Dwyer and Forsyth 1999)		x				
(Aguiló, Riera, et al. 2005)		x		x		x
(Litvin et al. 2006)		x			it depends on how tax funds are spent	
(Pintassilgo and João Albino 2007)	x				x	
(Gago et al. 2009)		x	x			x
(Rey-Maquieira et al. 2009)	x					x
(Kato et al. 2011)		x				x
(Oom Do Valle et al. 2012)		x		x		x
(Cetin 2014)		x			no recommendations	
(Lee 2014)		x		x	disadvantage against nearby competitors	
(Mak 2015)		x			mixed effect	
(Candela et al. 2015)	x				x	
(Arguea and Hawkins 2015)		x		x		x

Bonham and Gangnes (1996) adopted a more sophisticated model which can consider other variables (such as Japanese and US stock price, the appreciation of the yen, and the wages in the Hawaiian hotel industry) that could affect the hotel revenues before and after introducing the hotel room tax but found no significant evidence of negative growth effects of room tax. One explanation that the authors

gave to these findings is that tourists pay the tax at the end of their holiday and not when they plan their holiday. Furthermore, their model did not study the impact of the room tax on other tourism sectors, such as restaurants and tourist attractions that could be influenced negatively by this tax due to budget constraints facing each tourist (Bonham and Gangnes 1996).

The room tax effect has also been studied in the United States (Hiemstra and Ismail 1993, 2001, Lee 2014, Arguea and Hawkins 2015) and in Spain (Gago et al. 2009) and all these cases the findings are not in favour of the introduction of this kind of tax. In particular, calculating the price elasticity of demand for lodging services, (Hiemstra and Ismail 1992, 1993, 2001) found that a counterpart to the imposition of the bed tax is a decrease in the amount of room rent; guests are charged by the tax only partially (28.4% of the room tax); and in the long-run, the lodging industry must absorb more than 70% of the total tax burden that leads to a decrease in the number of rooms rented.

On the contrary, from an analysis of the monthly tax revenue for the period 1997 to 2012, Arguea and Hawkins (2015) showed that only significant short-run decrease, and not long-run effects, in hotel revenue are identifiable due to an increase of bed tax by 1%. Starting from the common knowledge that hotels compete through prices, Lee (2014) also argued that bed tax increases the normal price of a hotel room and this implies that customers characterized by a certain degree of flexibility choose a hotel located in an alternative region if the initial and alternative locations are good substitutes. Therefore, governments have to carefully analyse the hotel market in neighbouring tourist destinations since the introduction or increase of bed tax can have a severe impact in terms of competitiveness, especially when alternative destinations are not subject to such tax. Also, Gago et al. (2009) obtained a related result for Spain by simulating the effect of a room tax equal to 10% of the room price applied only to non-resident, suggests that bed tax has no significant effect on the tourism industry in a destination as well as on its economy in general.

However, the adoption of this kind of specific tax is not recommended by managers and practitioners in the tourism industry since they consider it unfair in general, could create distortions and encourage bad practices such as tax evasion through operating in black markets (Gago et al. 2009, Sheng and Tsui 2009). As underlined above, the use of accommodation tax by the government is sometimes unclear and

this generates discontent in the tourism industry. In this regard, as shown by Litvin et al. (2006), if the government use accommodation tax to promote tourism projects, in particular festivals and special events, the negative demand impacts, caused by the imposition of the tax is reduced by a future increase in the lodging demand, which then meets the expectations of tourism operators for a fair tax. Therefore, the use of such kind of tax could lead to the healthy growth of the tourism sector and of the entire economy, which could benefit a return on investment in the form of more rapidly accommodation-sector growth (Litvin et al. 2006).

Although there is a significant difference in research suggestions, yet there is more support for a decrease in accommodation taxes. Interestingly, using a similar analytical technique (ARIMA) for the same country and tax type, while earlier assessment supported the use of AT in Hawaii (Bonham et al. 1992, Bonham and Gangnes 1996), a later assessment suggests otherwise in the case of Florida (Arguea and Hawkins 2015). It is, therefore, worthy of note the different regions studied. This suggests that the intensity of tourism activity in the destination is a significant factor in the use of accommodation taxes.

3.4.4. Challenges and future directions

Much progress is still needed to enrich the research focuses on AT in tourism research. Although there is a considerable number of researches focusing on the impact of AT on accommodation operators, most of the related works are early studies occurring before 2000. A number of these studies were revisited following advancements in techniques and data availability. Therefore, thought-provoking empirical studies that apply more advanced techniques may provide further evidence and confirm or refute existing research suggestions on the impact of AT on lodgers' flows, firm revenue, and tax incidences. Furthermore, research focuses on the impact of AT on tourists' lodging choice behaviour is scant in the literature. Studies that adopt only exploratory analysis or descriptive statistics cannot be generalized even when they present exciting research focuses. For instance, a further study related to that of Dwyer and Forsyth (1999) is vital, to provide more evidence for the motivation by the government to use bed taxes to finance sports, festivals or other similar events. This also applies to the studies by Litvin et al. (2006) and Kato et al. (2011).

Additionally, the data used were mainly time series with only one study using panel data. With the improvement in data collection mechanisms (internet data, big data, online surveys, etc.), other data forms, such as cross-sectional data (across regions or countries) available over a long period, have emerged and could provide new substantial information about the trend of tourist choice of accommodation in countries with significant differences in accommodation tax rates. To achieve this, new studies can adopt econometric techniques, such as Heckman's selection; multinomial logit/probit; and propensity score matching, to explain tourist choice behaviour and how such behaviour is modified by accommodation tax.

3.5. Environmental tax

While the motivations for applying accommodation taxes are sometimes weak, arguably because it mostly reflects governments' need to create an extra revenue source, the justification for the use of environmental taxes on tourism is much stronger. Environmental taxes (ET) consist of a group of taxes, levies or fines charged on tourism activities mainly due to the adverse impact of such activities on the environment. ET is another valuable type of tax considered in tourism research such as Air Passenger Duties (APD); carbon tax; transportation tax; and road tax. APD is levied by the government of a departure country and is based on the use of specific service or usage of the airport. In Europe for instance, seven countries currently impose APD (Austria, Croatia, Czech Republic, France, Germany, Italy, and the UK). The resultant ET has already been employed to estimate and predict the impact on travel and tourism demand; government revenue; air passenger movements; and overall economic impacts. Also, apart from an early study on air transport tax in the US (Abeyratne 1993) and air passenger duty in the UK (Nevin 1999), attention only shifted to ET since the early 2000s.

3.5.1. Research focuses

According to previous studies, environmental taxes have been reasonably investigated in tourism research, especially in terms of its impact on the tourism industry and the economy (Forsyth et al. 2014, Seetaram et al. 2014). Air transport taxes were the top researched environmental tax as shown in table 3.4.

Table 3.4. Studies on environmental taxes

Authors	Nature of the article		Kind of model	Suggestions

	Theoretical	Empirical		Kind of tax				
		Case study	Simulation		Other	CGE	Increase/ Introduce	Decrease /Eliminate
(Abeyratne 1993)	x			ATT				x
(Nevin 1999)		x		APD	DA			x
(Palmer and Riera 2003)	x			ET	Review		short-term loss of competitiveness; Eco-tax is only an instrument to generate revenue	
(Aguiló, Alegre, et al. 2005)		x		ET	SUR			x
(Gössling et al. 2005)		x		ET	DA		no recommendation	
(Palmer-Tous et al. 2007)		x		TT	Count model		little effect	
(Mayor and Tol 2007)		x	x	APD				x
(Tol 2007)			x	Carbon				x
(Gómez-Lobo and González 2008)		x		APD	Non-parametric			x
(Brida and Pereyra 2009)	x			ET			little effect	
(Beladi et al. 2009)			x	ET			x	
(Mayor and Tol 2010)		x		ETS	x		little effect	
(Logar 2010)		x		ET	DA		the effect depends on the demand elasticity	
(Chang et al. 2011)	x			ET			x	
(Oom Do Valle et al. 2012)	x			ET	CHAID			x
(Dwyer, Forsyth, and Spurr 2012)		x		Carbon		x	the effect depends on which measures are adopted by the other countries	
(Russu 2012)	x			ET			no recommendations	
(Josep et al. 2012)	x			ET			little effect	
(Aguiló et al. 2012)		x		TT	Binary model		petrol tax better than a tax on the use of private cars	
(Blanc and Winchester 2012)			x	APD	PDM			x
(Bakhat and Rosselló 2013)		x		TT	Double-log model and partial adjustment model		little effect	

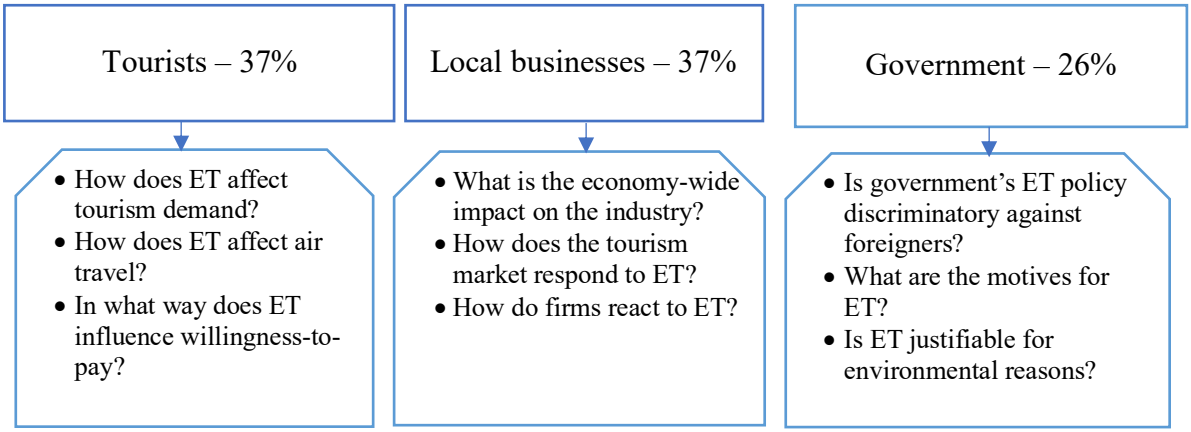
(Forsyth et al. 2014)		x		APD		x	the effect depends on the demand elasticity	
(Seetaram et al. 2014)		x		APD	Double-log model and ADLM			x
(Álvarez-Albelo et al. 2017)	x			APD			mixed effect	
(Meng and Pham 2017)		x		Carbon		x		x
(Zhang and Zhang 2018)		x		Carbon		x		x
(Seetaram et al. 2018)		x		APD	Contingent Valuation Method		mixed effect: APD rates can be set depending on consumer willingness to pay which varies with a combination of hauls and travel class.	
(Falk and Hagsten 2018)		x		ATT	DID		x	
(Song, Seetaram, et al. 2019)		x		APD	SUR		no recommendations	

Note: ATT represents Air Transport Tax; APD represents Air Passenger Duty; TT represents Transportation Tax; ET represents other Environmental Tax; ETS represents Emissions Trading Scheme; DA represents descriptive analysis only; SUR represents Seemingly Unrelated Regressions; CHAID represents Chi-square Automatic Interaction Detector; PDM represents Panel Data Model; ADLM represent Autoregressive Distributed Lag Model; DID represents Difference-in-Differences.

Generally, research on ET can be recapitulated and clustered into three central focuses as shown in Fig. 3.6. Unlike studies on accommodation tax, there is a good number of studies across the three group. In group I, research focuses have been on tourism demand including both expenditure and air passenger arrivals (and departures). Studies have also focused on welfare and how ET modifies budget allocations. In group II, the impact of ET on the tourism industry has mostly been reported. This also includes impact on the employment of human and material resources; firm revenue; and forecast of the market. In group III, research focuses on ET extends to government rate of ET and motive (Gómez-Lobo and González 2008, Russu 2012).

Figure 3.6. Categorization of the research focus of studies on environmental tax

Group I **Group II** **Group III**



Source: Author

3.5.2. Data characteristics

From table 3.4, this study finds that data fed into CGE models and simulation exercises were the most popular for investigating the economy-wide impact of environmental taxes using the Input-Output databases. Specifically, the tax data commonly investigated is gotten from rates of the Australian carbon tax. Another data used in examining ET is time-series data on variables such as inbound and outbound tourist numbers by air to and/or from the tax-levying county.

Survey data have also been used in ET studies especially on the impact of ET on consumer behaviour (Seetaram et al. 2018, Song, Seetaram, et al. 2019). Palmer-Tous et al. (2007) used data obtained from Mallorca airport surveys on 764 tourists who visited the island in the high season (May to September). Such data can provide rich information on tourist attributes; trip characteristics; economic data; psychographic characteristics of respondents. Additionally, surveys afford researchers the ability to combine qualitative methods with quantitative information of tourists and their trips to produce insightful research findings (Logar 2010). To advance the study of consumer behaviour arising from tourism taxes, more survey data are desirable.

3.5.3. Analytical techniques and research suggestions

Centred on different data structures, diverse analytical techniques have been used to investigate environment-based tourism taxes and their impact on the economy. This includes CGE models, simulations, time series and panel techniques. Also, studies that use survey data utilize the non-parametric technique, contingent valuation, and seemingly unrelated regression techniques. Thus, due to the

uniqueness of information from survey data over other data types, these techniques were able to provide results that highlight the impact of environment-based tourism taxes on consumer behaviour. For instance, recent findings have demonstrated how air passenger duties moderates consumers' budget structure and spending behaviour (Song, Seetaram, et al. 2019) as well as the importance of passengers' willingness to pay such taxes (Seetaram et al. 2018).

In terms of existing research suggestions, authors have made efforts to establish that the long-term sustainability of the tourism sector depends on the quality and conservation of the natural resources available at the destination. The link between tourism and the environment is clear: tourism causes high levels of noise, pollution, crowding, congestion, more garbage, but the changes of the landscape could be both negative (new building close to the beach) and positive (new parks, higher attention to the conservation of natural resources). Thus, governments need to adopt policies and strategies which can preserve both environments as well as the growth of the tourism industry. Also, due to the increasing negative effect of aviation on climate change and CO_2 emissions, the European Commission decided in 2008 to include aviation emissions to the European Union Emissions Trading System (EU ETS) for greenhouse gases (Blanc and Winchester 2012). To satisfy the new EU agenda, aviation taxes have been imposed by Denmark, Germany, Austria, France, Malta, the UK, and the Netherlands (Forsyth et al. 2014).

Within the broad literature regarding the effects of environmental taxes on the tourism sector, a lot of attention has been paid to the analysis of the effects induced by carbon and fuel tax (Aguiló et al. 2012), eco-tax (Logar 2010), accommodation tax for an environmental purpose (Josep et al. 2012), and APD (Forsyth et al. 2014, Seetaram et al. 2014). A schematic list of these studies, along with the major findings and recommendations on environmental taxes, are reported in Table 3.4.

As pointed out by Palmer-Tous et al. (2007), in the last decade tourists avoid package holidays and preferred self-made holidays. Furthermore, the changes in life habits have led tourists to prefer the "many but short" holidays formula instead of the "less but long" holidays formula, increasing tourism mobility in general. Consequently, tourism destinations are experiencing an increased number of daily tourists with a subsequent increase in congestion, among other effects. To address this problem, Palmer-Tous et al. (2007) explored the effect of the introduction of a

fixed-rate tax on vehicle hire in Mallorca (Spain). Through the analyses of the demand elasticity estimated using different count models, their study demonstrated that this tax mechanism helps to correct congestion problem only marginally and that the efficiency of this mechanism can be enhanced using tax revenue to improve the existing public transport system (Palmer-Tous et al. 2007).

Similar findings have been obtained by Aguiló et al. (2012). They analysed the efficiency of the introduction of a corrective mechanism in the Balearic Islands i.e. the introduction of a tax to discourage the use of private cars. Also, the introduction of a petrol and diesel tax during high-season months followed by an accurate investment in public transportations by local governments seemed more efficient (Aguiló et al. 2012). Bakhat and Rosselló (2013) have further investigated the short and long-run effects of the introduction of a petrol and diesel tax in the Balearic Islands, focusing on the analyse of differences among seasons. Their findings confirm a difference in the price sensitivity among seasons in the short-run for diesel drivers (more sensitive in the low season) and in the long-run for gasoline drivers (more sensitive in the low season). However, the relative low-price elasticity estimated in the short-run reveals that this mechanism is both inefficient (gasoline consumption is reduced only by a small amount without a significant improvement of the environmental quality) and inappropriate (the tax on diesel mostly affect residents).

Additionally, to overcome general negative environmental externalities associated with tourism, several different taxes (such as eco-tax, carbon tax, and APD) have been adopted by governments but none of them has resulted to be an efficient correction measure (column 5 of Table 4). In this respect, the conclusion of Palmer and Riera (2003) regarding the Balearic eco-tax is that this kind of tax is "purely and simply an instrument designed to generate revenue" and not an instrument to correct the level of pollution and environmental damages that occur as a result of the development of tourism. The same conclusion has been reached by Nevin (1999), Mayor and Tol (2007), and Seetaram et al. (2014) who investigated the effect of the introduction of APD in the UK.

APD is a boarding tax that can generate new tax revenue, but only reduces emissions marginally (Mayor and Tol 2007, Gómez-Lobo and González 2008, Seetaram et al. 2014) and is conversely able to erode the competitiveness of the

destination compared to alternative or substitute tourism destinations that do not adopt this measure (Nevin 1999). Mayor and Tol (2007) found that the use of a carbon tax could instead be more efficient than the APD tax, but also there is a low of destination's competitiveness (Tol 2007, Dwyer, Forsyth, and Spurr 2012) especially for tourism-dependent Island economies (Tol 2007). To investigate Willingness To Pay (WTP) for APD by UK outbound tourists in 2015, Seetaram et al. (2018) adopted the contingent valuation method and found that WTP depends on the travel hauls and class and so APD rates should be set in consideration of these.

3.5.4. Challenges and future directions

Generally, research into ET gained prominence in the early 2000s, and this created much room for researchers to contribute novel research findings in this area, especially from the standpoints of research focuses and improvement in data and analytic technique. Also, the expansion of ET research is not unconnected to increasing public awareness and research in global emissions and climate change. In terms of research focuses, the issue of the environment – climate change and global warming – is a great deal and a justifiable reason for levying tourism tax. Thus, given the number of studies on this topic, much of the research focuses have attempted to answer valuable research questions. However, with the availability of rich datasets, research on ET can not only provide us with a better understanding of tourist, firm or government behaviour but can also be applied to study issues of the tourism market and environmental (social) carrying capacity with an emphasis on how such issues are driven by government's tourism tax policies. Additionally, since research in this area seems to respond to new government tourism tax regulations, new research that assess policy impact and provide frameworks are important for businesses and tourists alike.

As regards analytical techniques, the spread of techniques used is not skewed towards any particular method, unlike in studies investigating general and accommodation taxation. The spread of research techniques may be attributed to the representativeness of research focuses and the data used. Many of the existing research relied on secondary data (times series and panel data) which guided the econometric technique employed. However, such techniques might ignore important features that can provide micro-level research conclusions.

Consequently, studies that exceptionally address new taxes in Norway (2016) and Sweden (2018) but adopting both microeconomic and macroeconomic impact assessments are strongly recommended. Studies adopting panel data analysis are, however, necessary to further strengthen country comparisons. Bias in adopting survey data should also be overcome by adopting larger samples and ensuring the reliability of instruments used.

3.6. Conclusion

With the continual growth of the tourism industry, especially in terms of contribution to GDP, employment and service exports, several taxes (and surcharges) have been introduced by the government. The introduction of these taxes has motivated researchers in the field of economics, energy, and tourism research, to assess the impact of tourism taxes. Consequently, to present the different tourism taxes adopted by the government and previous studies discussing their impacts, this paper provides a comprehensive review of the literature. Furthermore, since different tourism taxes research address different focuses, a systematic analysis was carried out for each tourism tax type via four perspectives: research focus; data characteristics; research suggestions; main challenges; and future directions. In sum, this review presents an understanding of tourism tax research and provides insights into future areas of research.

To start with, studies on tourism taxation gained prominence at different times with the earliest studies being on accommodation tax (Combs and Elledge 1979). A reason for this is due to very little attention given to the tourism industry, with only accommodation been the major expenditure in tourist budget. However, with the growth of technology and transport, tourism services became increasingly relevant globally. The growth of the tourism industry was not without certain externalities, one of which is its contribution to CO_2 emissions and climate change. Hence, the introduction of tourism taxes was considered as one way of correcting negative externality from tourism activities and not necessarily as a means to generate additional government revenue. Consequently, several researchers have made efforts to investigate such issues, considered as the role of tourism taxes on the tourists, firms, and the government, with more articles published in the last three decades.

As table 3.5 shows, tourism taxes adopted by government over the years can be grouped into three, which include: general taxation (GTT); accommodation tax (AT); and environmental tax (ET). In assessing the impact of these tourism taxes, the kind of research approach adopted is split mainly between theoretical studies and studies which employ diverse econometric/analytic models. On one hand, across the three tourism tax groups, studies on general tourism taxation possess a higher number of studies which are theoretical or at best adopt descriptive statistical analysis. On the other hand, this study observes more diversity in terms of econometric/analytical models in studies on environmental taxes.

The concentration of research focuses was highly dependent on the tourism tax type. For example, more studies on general tourism tax focused on the policymakers, but more studies on accommodation tax focused on firms (accommodation providers). The former could be due to the general tax atmosphere of the tourism industry, which makes researchers more interested in the motive of the government as well as the structure and appropriate rate of tax. Hotel owners are more interested in the latter, however, and may sponsor research in this area. Either way, there is a dearth of literature on consumer choice behaviour in both tourism tax categories. Additionally, despite improvements in methodology and data, there still exists ample room to develop tourism tax research especially from the perspective of expanding research area and focuses as well as developing analytical techniques to provide more empirical arguments.

Furthermore, this study compares the features of each tourism tax type and observe certain gaps in the existing body of knowledge. Hence, recommendations are made as an agenda for future research as shown in table 3.5. First of all, in accommodation taxes, the use of ad-hoc survey data to analyse tourist choice behaviour as a result of the destination's general tourism tax environment is missing. Such a study can aid our understanding of a destination's image from the lens of tourism taxes, and how taxation pass-through to prices moderate tourist behaviour. There should also be an empirical estimation of welfare effects. Secondly, in terms of VAT on specific tourism services such as casino, only theoretical discussion exists. Hence, it is worthwhile to assess the impact of tourism taxes on firms that provide such services and other related tourist services such as gambling. Finally, although up to 62% of studies on GTT has been on the

government, yet, it is important to show whether tourism taxation is a better alternative for funding tourism services by local governments since only a descriptive analysis has been conducted (Burns 2010).

In terms of accommodation taxes (AT), up to 61% of studies have been on firms. Hence, for tourists, it is important to examine how a destination's position in the global tourism industry (i.e. destination's market power) influence the government's levying of AT. This is because there is an insufficient amount (only 9%) of studies on consumer behaviour towards accommodation tax. Also, it is important to demonstrate to what extent accommodation providers shift the burden of tax to tourists and whether this differs from other tourism services such as restaurants. This can be achieved by utilizing more advanced techniques as well as other forms of data e.g. big data, scanner data, etc. It also contributes to knowledge if these studies are conducted in other regions other than the US and Italy.

Conclusively, for environmental taxes (ET), there has been a nearly equal spread of studies focusing on tourist, firms and government. However, for tourists, it is informative to investigate how existing findings on the impact of ET on tourist demand and welfare differ in other regions, apart from Europe and Australia. This is important to highlight whether destination-specific factors moderate the impact of ET on tourist travel behaviour. Also, for taxes charged directly to airline operators for emissions or other reasons, it is necessary to study to what extent these airline operators shift such (e.g. carbon tax) on travel cost and its impact on the number of passengers. This requires a larger sample to assess the market-wide impact such as revenue and pricing through an ad-hoc survey.

Table 3.5. Comparison of tourism taxes

Tourism tax type	Research focuses	Kind of research	Agenda for future research
I. **General tourism taxation (GTT)** (For example, VAT and General sales tax)	How does tourism tax adjust tourists cost and benefits?	Theoretical Models	**For tourists:** The use of ad-hoc survey data to analyse tourist choice behaviour as a result of the destination's general tourism tax environment. Empirical evidence on the welfare effects of general tourism taxes. There is only theoretical assessment in the literature
	What is the impact of GTT on tourism demand and welfare?	Econometric Models	
	How does market power impact GTT?	Theoretical Models	**For firms:** Only theoretical discussion exists on the impact of VAT on specific tourism services such as a casino.
	What is the impact of GTT on hotel and restaurant?	Simulation	
	What is the impact on industry output and factor prices?	Simulation	
	Assessment of government's GTT policy – rates, increase/decrease and administration.	Theoretical and Econometric Models	**For the government:** Is tourism taxation a better alternative for funding tourism services by local governments? Only a descriptive analysis has been conducted (Burns 2010).
	What is the appropriate GTT structure (central/regional) and the government's use of GTT?	Theoretical Models	
	What is the impact of GTT on government fund and macroeconomy?	Theoretical and Econometric Models	
	How is the price of lodging affected by AT?	Econometric Models	**For tourists:**

Tourism tax type	Research focuses	Kind of research	Agenda for future research
II. **Accommodation tax (AT)** (For example, Bed tax and occupancy rates)	Does the motive of levying AT modify tourist behaviour?	Theoretical	How does the destination's position in the global tourism industry (i.e. destination's market power) influence the levying of accommodation taxes? Insufficient amount of studies on consumer behaviour towards accommodation tax
	How does firm revenue react to AT?	Econometric Models	**For firms:** To what extent do accommodation providers shift the burden of tax to tourists? Does this differ from other tourism services such as restaurants? This can be achieved by utilizing more advanced techniques as well as other forms of data e.g. big data, scanner data, etc. It also contributes to knowledge if these studies are conducted in other regions other than the US and Italy.
	How exportable is AT?	Econometric Models	
	How does AT moderate the link between industry and environment?	Econometric Models	
	Are AT justifiable?	Theoretical Models	**For the government:** Existing research questions have been addressed via exploratory study and descriptive statistics, but lack empirical support
	What matters in designing AT framework?		
	How far can AT be put to public use?		
	How can AT capture rent?		
	How does ET affect tourism demand?	Simulation & Econometric Models	**For tourists:**

Tourism tax type	Research focuses	Kind of research	Agenda for future research
III. **Environmental tax (ET)** (For example, Airport charge; Air passenger duty; Carbon tax; Emission trading scheme; Fuel tax; Passenger movement charge; and Transport tax)	How does ET affect air travel?	Simulation & Econometric Models	How do existing findings on the impact of ET on tourist demand and welfare differ in other regions, apart from Europe and Australia? Do destination-specific factors moderate the impact of ET on tourist travel behaviour?
	In what way does ET influence willingness-to-pay?	Econometric Models	
	What is the economy-wide impact on the industry?	Econometric Models	**For firms:** To what extent do airline operators shift the carbon tax on travel cost? This requires a larger sample to assess the market-wide impact such as revenue and pricing through an ad-hoc survey.
	How does the tourism market respond to ET?	Econometric Models	
	How do firms react to ET?	Econometric Models	
	Is the government's ET policy discriminatory against foreigners?	Theoretical Models	**For the government:** Existing research has been addressed using exploratory and descriptive statistics, but lack empirical support
	What are the motives for ET?	Theoretical Models	
	Is levying ET for environmental reasons justifiable?	Theoretical Models	

Chapter Four. Models and Methods

4.1. Introduction

In chapter one, relevant economic theories on which this thesis is hinged were discussed and the dynamics of tourist behaviour and tourism demand functions were highlighted. This was followed by a review of empirical studies accessing the micro and macro level determinants of tourism demand and tourism expenditure respectively. However, the models and methods used have not been discussed until now. Thus, this chapter consists of a review of models and methods of macroeconomic analysis of tourism demand determinants, together with a discussion of measures and methods of analysis of factors that determine tourist expenditure. The purpose of this chapter is not only to account for variations in modelling techniques but also to guide the empirical chapters that follow, based on data collected to achieve the wider objectives of this thesis.

4.2. Models and methods in tourism demand modelling

One of the earliest data available and technique employed to estimate tourism demand models is the time-series data and ordinary least squares respectively (Lim 1997). A survey of the literature shows that few articles adopt only time-series data when compared with studies that use panel datasets which is made up of a combination of annual, quarterly, monthly, or daily data pooled over some time for many countries, cities/municipalities, or regions. Quarterly data is also mostly used since it not only gives accuracy in demand forecasting but also maximizes estimation of shocks in the model and identification of variations in large evaluations (Bonham et al. 2009).

In situations where lesser prior knowledge is available, time-series techniques are useful for evaluating economic models to some extent. To such extent, both validity and adequacy of the model can be tested (Howrey 1980). A basic time-series technique is the ordinary least square (OLS). However, to overcome spurious regressions among other potential limitations of the OLS technique, many studies have rather adopted more advanced time series methods. For example, Dragouni et al. (2016) used Vector autoregressive (VAR) approach to model tourism demand. The VAR technique is a system of equations where all the variables involved are endogenous and each one is determined as a function of past values of all

endogenous variable. This approach is used to label interrelationship among stationary variables. Additionally, Pham et al. (2017) and Kim and Lee (2017) modelled tourism demand by employing the Paris-Winsten regression. This technique is employed to transform the dataset to correct for serial correlation in the error term. It is also a type of feasible generalised least squares (FGLS) for estimative models.

More so, another common technique employed in modelling tourism demand is the autoregressive distributive lag (ARDL) (Song and Li 2008). It has been used in the tourism literature to construct inbound and outbound tourism demand models. The ARDL technique makes allowance for endogeneity problems and has been used to analyse the determinants of tourism demand by Seetaram et al. (2014) for outbound tourism from the UK; Wang (2009) for inbound tourism to Taiwan; and Bankole and Babatunde (2010) for inbound tourism to Nigeria. This technique also makes provision for the long run and short-run parameters of the model to be estimated simultaneously. Unlike other time series technique that requires variables to be integrated of a particular order, the improved version of ARDL allows for the variables to be used irrespective of their order of integration. Other time series techniques used in the tourism demand literature include the Vector error correction (Bonham et al. 2009); Error correction model (Chaitip and Chaiboonsri 2009); the autoregressive-moving-average model with exogenous inputs (ARMAX) (Lim et al. 2009); and the autoregressive integrated moving average (ARIMA) (Untong et al. 2015).

There are various benefits of using panel data: estimation is done utilizing a bigger number of observations with the goal that issues of degrees of freedom are more averse to emerge; complex causal relationships can be established, and we can control for unobserved variables to potentially mitigate the problem of omitted variable bias. Additionally, the use of panel data enables the control of potential bias and can help account for individual heterogeneity and is constructed by merging a cross-section of individual units across time. Techniques applied to panel data also gives more information and can be flexible to account for more variability; less collinearity; and more degree of freedom due to data aggregation (Baltagi 2005, pp. 4–7).

Although, panel data may suffer from the problem of cross-sectional dependence, attrition and possible distortions of measurement errors (Baltagi 2005, pp. 7–9), yet, several econometric techniques and tests have provided solutions to these challenges. In tourism demand modelling, several empirical techniques have been applied to panel data. These include Arellano-Bond (Brida and Risso 2009, Garín-Muñoz 2009, Buigut 2018); Generalized method of moments (GMM) (Rodríguez et al. 2012, Seetaram 2012, Dogru et al. 2017a); and most common is the panel cointegration, fixed and random effects (Fernandes and Karnik 2010, Seetaram 2010). This is useful to study demand functions and the effect of habit persistence on tourism demand. Usually, a static model can be transformed into a dynamic panel data model by including a lag of the dependent variable as one of the explanatory variables.

The fixed effects techniques are popular in many studies using panel data because they control for time-invariant characteristics in the units observed. Also, there is less bias in the estimated coefficients. A basic panel data technique is the least squares dummy variable (LSDV) which can provide for both individual and time-specific effects in panel regressions. What differentiates both effects in panel estimations is whether the unobserved individual effect includes elements which are correlated with the regressors in the model (Greene 2003, pp. 293–294). Other techniques applied to panel data in tourism demand modelling include the two-stage least square (2SLS) (Hong Tsui 2017). 2SLS is an extension to the OLS technique used to fit economic models using instrumental variables as well as can act as an alternative to structural equation models.

In addition, other techniques to model tourism demand have been employed over the years. Cortés-Jiménez et al. (2009) and Saayman et al. (2018) used Seemingly unrelated regression (SUR) developed by Zellner (1962) as a technique to estimate tourism demand models. SUR generates numerous regression equations, each having its dependent variable and different sets of explanatory variables. Additionally, structural breaks developed by Bai and Perron (1998) have also been tested in tourism demand modelling literature. For example, Cró and Martins (2017) adopted structural breaks to investigate the vulnerability of international tourism demand to both crisis and disaster shocks. The benefit of using structural

breaks is to accommodate shocks that could have a permanent impact but are not captured by the model.

4.3 Tourism Expenditure: Measures and Methods of Analysis

According to Wang and Davidson (2010), some common micro-level measures of tourism expenditure include: per capita daily visitor expenditure; total expenditure per tourist; expenditure per person per day; and personal tourism expenditure (Alegre et al. 2013, Marrocu et al. 2015, Disegna and Osti 2016, Salgado-Barandela et al. 2018). These measures usually include the large size of zero expenditure values and present tourism spending as a non-negative distribution. These measures are distinguished from arrivals or number of nights which are usually applied as macro-level measure of tourism demand.

A review of studies on the determinants of tourism expenditure shows that many studies adopted the ordinary least squares (OLS) technique in linear regression models (Wang and Davidson 2010, Brida and Scuderi 2013, Wu et al. 2013). However, such a method may result in unstable and lopsided parameter estimates (Maddala 1983, Amemiya 1984) since the basic assumptions about the dependent variable are usually unrealistic. To address the challenge of zero expenditure and create a suitable estimation for censored dependent variables, the tourism field has seen the application of the Tobit regression model. In their analysis, Leones et al. (1998), Lee (2002), Barquet et al. (2011), Gon Kim et al. (2011), and Zheng and Zhang (2013) estimated the determinants of tourism expenditure by applying the Tobit model.

The ‘double-hurdle’ model is an advancement of the Tobit model (Cragg 1971). According to Pudney (1989), a major advantage of the double-hurdle model is that it divides the decision-making process into two stages: a decision stage, which is also the selection stage; and the choice of how much to spend which is the outcome stage. Although modelled differently, both decisions are assessed under similar consumer decision process in the Tobit model, with an assumption that independent variables which influence selection stage, with the same direction and intensity also influence the outcome stage. The Cragg model treats the two decisions as separate. The implication is that the model applied at the second stage calculates the average tourism spending using data obtained from a population in which individuals who do not spend are excluded by self-selection.

The Heckman (1979) model introduces the inverse mill's (IM) ratio, which corrects the bias in the calculation of the second stage estimation. IM ratio is calculated using the estimations provided from the first stage equation. The major highlight of the Heckman model is that it allows the correlation of the errors of the two equations and makes it co-dependent. Heien and Wesseils (1990) have proffered an alternative to the mill's ratio of the Heckman model. Their formula allows the utilization of observations in the first and second stage whereas the Heckman model exempts zero observations in the second stage. Weagley and Huh (2004) adopted the double-hurdle model to study the leisure spending of retired and near-retired Americans households. Hong et al. (1999) also studied travel spending patterns of elderly households in the USA using the double-hurdle model.

The Heckman model has been applied in a series of studies: Alegre et al. (2013) analyzed tourism participation and expenditure by Spanish households and found that unemployment information of household helps to understand of tourism expenditure across the business cycle; Jang and Ham (2009) analyzed leisure traveller's expenditure and they found that expenditure patterns differ between baby boomer senior households and older senior households in the USA; Dall'Aste Brandolini and Disegna (2012), Brida, Disegna, and Osti (2013a, 2013b), and Brida, Disegna, and Scuderi (2013) analyze tourist expenditure behaviour using the Heien and Wessells two-step estimator.

4.4 Conclusion

This research examines the role of tourism taxes on tourism expenditure using household data on one hand and tourism demand using annual national data on the other hand. There are several techniques used to assess microeconomic determinants of tourism expenditure and the macroeconomic determinants of tourism demand. While time series techniques and panel techniques are prevalent in the latter, micro-econometric techniques are prevalent in the former. This chapter shows that for an assessment of household participation and consumption of goods and services, the double Heckman has been used significantly in the tourism literature.

Unlike other determinants of tourism demand discussed in this review, studies on the impact of tourism taxes can be understood from the methodology point of view. The reason for this is because, firstly, tourism taxes are of different types, and

secondly, studies on tourism taxes have benefitted immensely from methodological development over the past two decades. Hence, the methods of estimating the impact of tourism tax are grouped into two broad categories, namely partial or general equilibrium models. Partial equilibrium analysis focuses on specific sub-sectors like accommodation or air passenger arrivals, while general equilibrium considers economy-wide effects. Although early studies mostly adopted partial equilibrium and made theoretical contributions in this area, recent methodological developments have tilted towards the use of computable general equilibrium models (CGE). For example, the effect of tourism tax changes on the economy of Denmark (Jensen and Wanhill 2002) and Spain (Blake 2000) were the first group of studies using CGE technique. Also, based on the context of the study, the various construct of the CGE model has been adopted.

Additionally, apart from being able to predict the economic-wide impact of tourism taxes, the CGE model allows for assumptions on the market in terms of demand and supply (household, investment, government, exports etc.) as well as tourism demand elasticities. Although there are standard elasticity measures such as the Armington elasticities, great care is needed when making these assumptions as this can be a potential limitation to correct estimation of tourism tax impacts. Notwithstanding, most studies on tourism taxation have focused on the use of CGE models. In terms of the response of tourism to taxes, estimated elasticities from CGE models are not entirely dissimilar, although the international comparison is limited given the uniqueness of each country's model. The range of estimate includes a decrease of tourism demand by 0.02% (Mayor and Tol 2007) as a result of the increase in APD in the UK; 0.8% (Tol 2007) as a result of introducing a carbon tax (Global kerosene tax) of US$1000; and between 0.63% and 1.17% (Dwyer, Forsyth, Spurr, et al. 2012); the findings of a decrease of 0.41% by Meng and Pham (2017) also falls within the range of elasticity estimated by previous authors. Unlike general equilibrium models, a higher range of elasticities is observed for studies that adopt partial equilibrium models with tourism demand elasticity for taxes ranging between 1% to 2.4% even when estimated for a single country (Australia).

In sum, this study uses the Heckman model to assess the determinants of tourism expenditure in the EU in two stages; firstly, whether household chooses to

participate or not and what determines this decision; and secondly, how much household decides to spend on domestic tourism. Both decisions are modelled to include the presence of tourism taxes.

Chapter Five. Domestic Tourists' Expenditure Behaviour in the EU: The Influence of Tax on Tourism Services

5.1. Introduction

The impact of tax on tourism services has been a subject of debate in recent times, with much emphasis on its effect on job creation, government revenue, correcting negative externalities such as environmental degradation, domestic value creation, and tourist flows. However, while it has been largely assessed at the macroeconomic level, its microeconomic impact concerning household participation in domestic tourism activities has received little attention. For instance, one of the macroeconomic arguments for taxing tourism services is that it places the burden on those generating the costs, hence, it is exportable to foreigners. Nevertheless, the net benefit from the tourism industry depends on the suitability and effectiveness of the tax system for the tourism sector (Mak, 2006). Thus, given the complexity of taxing tourism as governments introduce new tax systems and reform the structure of existing ones to target tourists, some academics argue against these taxes on the basis that they affect the national economy by decelerating growth rates and reducing the potential for creating and sustaining employment (Dwyer et al., 2012; Seetaram et al., 2014; Arguea and Hawkins, 2015). Despite these arguments, analysis of its microeconomic impact, specifically on household participation and spending behaviours, remains an under-researched area.

Unlike the few studies that assess the impact of tourism tax on consumer behaviour (e.g. Seetaram et al., 2018; Song et al., 2019), the current study investigates how tourism tax in EU countries influences household decisions to participate in and spend on domestic tourism. Apart from the typical socio-demographic, economic and trip-related characteristics, investigating how tourism tax affects household domestic tourism decisions is a significant departure from the previous literature. Additionally, rather than employing tax as a determinant of tourism consumption at a national level (Gago et al., 2009; Jarkko and Kosonen, 2014), the current study uses microdata to investigate tourists behaviour at a household level. One reason for this is that microdata allows for analysis at the household level, which provides an opportunity to capture consumer behaviour towards tourism tax. Thus, this study tests household tourism participation and consumption behaviours in the presence

of tourism taxes. Since household spending on domestic tourism can be affected by the economic circumstances in the wake of the global financial crisis or because of other non-economic factors such as mobility, age, and family life cycle, country-level variables are introduced. However, determining whether sociodemographic variables moderate the impact of tourism tax on domestic tourism expenditure is a significant contribution to the tourism literature.

Consequently, firstly this study seeks to assess whether:

a) a high value-added tax (VAT) rate on tourism services reduces participation in domestic tourism

b) the impact of tourism tax paid on domestic tourism expenditure is moderated by the presence of children, gender, income class, and/or marital status

Secondly, with regards to other sociodemographic variables, this study tests whether the following impact a households' decision to participate in domestic tourism:

c) a high household income

d) a households' socio-demographic characteristics such as age, gender, education, employment, and marital status

e) a households' trip-related features such as location and number of household members

Empirical results from this study reveal that higher VAT rates on tourism services deter participation in domestic tourism activities, but there is a positive correlation between tourism expenditure and tourism taxation. This positive impact, however, does not hold for all classes of households, hence, the absolute impact of tourism taxation on domestic tourism expenditure is moderated by sociodemographic factors. Specifically, households with children are found to constrain the effect of tourism tax on domestic tourism expenditure; that is, for those households with children, the positive effect of tourism tax is weakened. Also, the impact of tourism tax is positive but reduced for singles. However, there is a negative effect of a female head of household, which implies that they are more aware of tourism taxes and are likely more resistant to spending on domestic tourism due to the influence of the tax, and they may consider the taxes an important factor of the total cost when

planning their budget. Additionally, as part of the moderating effects, the category of household income is also included. According to Alegre and Pou (2004), income above the median is a significant determinant of the probability to consume tourism products and services. Consequently, households in this study were divided into two income classes: above and below-median income. The motivation for this is to assess whether any differences exist between the two-income classes in terms of how they value spending on domestic tourism when tourism taxes are considered. Results show that an increase in tourism tax correlates with an above-median income household decrease in domestic tourism expenditure, which also implies that domestic tourism is less valued by higher earners.

The rest of the chapter is broken down as follows. The next section presents a review of literature on tourism taxation; section 5.3 discusses models and methods used in assessing tourism expenditure; while section 5.4 presents a detailed description of micro, tourism tax and economic data used for the study. Section 5.5 presents empirical results and discussions, and section 5.6 concludes this chapter with policy implications.

5.2. Literature Review

As demonstrated by Wanhill (1995), increasing tax on accommodation, dining out, and visitor attractions will weaken the UK tourism sector, as there are benefits from reducing tax specifically on accommodation. This was based on a sensitivity analysis conducted on consumers of UK tourism services. This finding is also supported when applied to a panel of countries in Europe (Jensen and Wanhill, 2002; Durbarry, 2008). Research into tourism taxation has also identified that a spill-over effect of a decrease in hotel tax on other consumer commodities in the tourism industry is relatively high and is encouraged (Manente and Zanette, 2010). Also, during times of economic recession that leads to a fall in the tax base, Arguea and Hawkins (2015) recommend a decrease in tourism tax rates, as an inverse relationship between the tax rate and tax base exists.

According to Sinclair, Blake and Gooroochurn (2005), small island economies suffer from inefficiency and a trade-off between tourism and other sectors. Hence, policy options are limited and must be carefully selected, given that tourism is the driver of such economies. Furthermore, in the case of tourism-dependent countries, a convenient and arguably efficient way to generate revenue is to impose tourism

taxes, given its diverse effects on tourism exports, domestic tourism, and other sectors in the economy (Gooroochurn and Milner, 2005). Other mixed effects of the impact of tourism taxes also emerge from the literature. Ihalanayake and Divisekera (2006) noted the importance of price elasticities in comprehending the supply and demand effects of passenger movement charges, visa charges, and aircraft noise levies. A mixed impact of tourism taxes on the economy can also be attributed to the market power of the destination (Sheng and Tsui, 2009), or be due to the share of tourism demand component of a commodity that is consumed by both domestic residents and tourists (Gooroochurn, 2009).

Another dimension to the tourism taxation debate is the decision on whether to use a specific or general tourism tax, and its potential impact on revenue, internalization of costs, and the economy at large. The use of specific or general taxes relates to the introduction of new taxes on selected tourism services, or simply increasing the VAT rates levied on tourist goods and services. Past studies on this topic reveal that both forms of tourism tax have similar effects, except in the case of hotels and restaurants (Gooroochurn, 2009). Whilst Seetaram, Song and Page (2014) found that the application of a specific tourism tax such as an air passenger duty is discriminatory and generates price distortions, other general tourism taxes like VAT have the potential for tax evasion, and are welfare-enhancing. Gago et al. (2009) support this view with a slight modification on the equity effects when tourism taxes are levied on the consumption of luxury goods targeted at richer households. This is arguable for income redistribution efforts of the government.

However, to assess the microeconomic impact of tourism taxes, other economic and socio-demographic variables apart from the tourism tax variable itself continue to remain relevant. Income is one of the most widely used determinants, and researchers have employed gross income either before or after tax. A decision to participate in tourism can be influenced by income. Hence, tourism expenditures are carefully examined by policymakers, planning officials, marketers, and researchers to identify its determinants. Although several studies have identified household demographics, trip-related characteristics, and psychographic variables as important determinants of travel expenditure (Wang and Davidson, 2010; Brida and Scuderi, 2013), research showing the role of tourism taxes in consumer behaviour is scant (Seetaram et al., 2018; Song et al., 2019). Other socio-

demographic determinants include age, education, occupation, gender, marital status, race, country, and origin. Age and origin are more frequently utilised than others. According to Lawson (1991), age, marital status, income, length of stay, and accommodation type play a significant role in travel expenditures. Although men and women may travel or participate in tourism for different purposes and their preference for travel experience may also differ, gender is reported as a less important variable for the tourism industry. For instance, while most men conventionally seek action and adventure, many women are likely to be more interested in cultural and educational experiences, with safety or security being a priority. Furthermore, education may provide training and preparation for some types of recreation activities. The impact of education on broadening ones' perspective towards leisure pursuits was also noted by Burdge (1969). Cai et al. (1995) concluded that the level of education of the representative head of the household is expected to be positively correlated with the expenditures on tourism activities of the entire household.

Given the foregoing, the study tests the following hypotheses:

a) **H_1**: A high VAT rate on tourism services reduces participation in domestic tourism in the EU

b) **H_2**: A high household income increases participation in domestic tourism in the EU

c) **H_3**: EU households' socio-demographic characteristics (age, children, gender, education, employment, and marital status) affects the decision to participate in domestic tourism

d) **H_4**: EU households' trip-related features (location and family size) affects the decision to participate in domestic tourism

e) **H_5**: An increase in tourism tax paid leads to a decrease in household expenditure on domestic tourism

f) **H_6**: The impact of tourism tax on household expenditure is higher for families with children

g) **H_7**: The impact of tax on household expenditure is higher for married household heads

h) **H_8**: The impact of tax on household expenditure is higher for households with female heads

i) **H_9**: The impact of tax on household expenditure is higher with households of above-median income

5.3. Model and Methods

5.3.1 Modeling Tourism Expenditure: Measures and Methods of Analysis

According to Wang and Davidson (2010), some common micro-level measures of tourism expenditure include: per capita daily visitor expenditure; total expenditure per tourist; expenditure per person per day; and personal tourism expenditure (Marcussen, 2011; Thrane and Farstad, 2011; Alegre et al., 2013; Brida and Scuderi, 2013; Marrocu et al., 2015; Disegna and Osti, 2016; Salgado-Barandela et al., 2018). These measures typically encompass a large size of zero expenditure values and present tourism spending as a non-negative distribution. A review of studies on the determinants of tourism expenditure reveals that many studies adopted the ordinary least squares (OLS) technique in linear regression models (Wang and Davidson, 2010; Brida and Scuderi, 2013; Wu et al., 2013). However, this method may result in unstable and lopsided parameter estimates (Maddala, 1983; Amemiya, 1984) since the basic assumptions about the dependent variable are usually unrealistic. To address the challenge of zero expenditure and create a suitable estimation for censored dependent variables, the tourism field has seen the application of the Tobit regression model (Tobin, 1958). Numerous academics have estimated the determinants of tourism expenditure by applying the Tobit model in their analysis (Lee, 2002; Barquet et al., 2011; Gon Kim et al., 2011; Zheng and Zhang, 2013).

5.3.2 The Double Hurdle and Heckman Model

In cases where the dependent or independent variable contains a high number of zeros, the OLS technique would produce biased and inconsistent estimates of parameters (Maddala, 1983; Amemiya, 1984). However, few specific models can be applied. This includes censored and truncated models, two-part models, and sample selection models. The traditional Tobit regression analysis is limited

because it assumes that the same set of variables influences the probability of participating in tourism (i.e., the participation decision) and the amount spent (i.e., the expenditure decision). For instance, in terms of household tourism expenditure, a household may have the financial ability to participate but may choose not to do so due to unique socio-demographic features. Consequently, this study adopts the double hurdle model proposed by Heckman (1979), which is a two-part form of the Tobit model (Tobin, 1958). The first part is known as the participation decision model, while the second part is the expenditure or spending decision model.

The double hurdle model accommodates the individuals' decision on whether to spend as well as the amount. This study introduces tourism tax in both household decision stages. In the first stage, the average VAT on tourism services is included to assess whether it influences tourists' choice to participate. In the second stage, tourism tax is introduced to assess its impact on tourist expenditure. Additionally, how the impact of tourism tax is affected by some socio-demographic sectors is also introduced in the second stage model. The probit model is employed in the first stage where household participation in tourism is modelled, while an OLS regression is estimated in the second stage since tourism expenditure is observed only if it is greater than zero. The two parts are estimated separately.

The double hurdle model has been widely used in many areas of household consumption behaviour such as alcohol and tobacco, meals, meat and food, and petrol and diesel (A. B. Atkinson, 1990; Labeaga, 1999; Bilgic et al., 2013; Ward et al., 2001; Newman et al., 2003; Mottaleb et al., 2017; Eakins, 2016). It has also been employed in the analysis of household spending on tourism, transport, sports, and leisure. Johansson-Stenman (2002) modelled household decisions in three and two levels and analysed the determinants of travel behaviour. Jang and Ham (2009) showed that the impact of socio-demographic and economic determinants on travel expenditure differ between baby boomer seniors versus older seniors in the United States. Thibaut et al. (2014) explored the determinants of household spending on sports using the double hurdle model and concluded that more educated households spend on sports, but the amount of money spent does not differ from less educated households. The influence of satisfaction and the dependence of spending categories were also identified as significant determinants of tourists' expenditure

behaviour using the double hurdle model (Disegna and Osti, 2016). Two separate regression models are performed.

While the double hurdle model is flexible and computationally simple, it is restricted by assuming the independence of the two decisions which can be inter-dependent in holiday or tourism decisions by households. This assumption of independence is a potential restriction of the double hurdle model. This is because, after controlling for regressors, households with positive expenditure are not randomly selected, which causes selection bias in the second-stage regression (Cameron and Trivedi, 2010). Consequently, recent applications to the tourism industry have seen the use of the Heckman model where tourism expenditure is modelled to be dependent on tourists' sociodemographic and economic factors, and also considers the possibility of a sample selection bias by allowing for some dependence in the two parts of the model (Alegre et al., 2013; Bernini and Cracolici, 2015; Campos-Soria et al., 2015; Brida and Tokarchuk, 2017; Lyu and Noh, 2017; Rodríguez et al., 2018). Moreover, there is a possibility that some households may simply make a simultaneous decision, which must, therefore, be accounted for in the econometric model. Hence, this study sought to resolve this by linking the two stages using a Heckman selection model in which the inverse mills ratio is used to account for the dependency between the two stages as well as any possibilities of selection bias.

Although the use of the Heckman model has increased considerably across many fields in the last decade, it is not without some limitations. Notably, sample selection bias is not detected only by a significant lambda, and while Heckman models accounts for endogeneity induced by the sample, it is ineffective in the presence of other sources of endogeneity (Carnahan et al. 2010). An alternative to addressing the selection bias problem other than the Heckman sample selection model is the survival bias (Demir and Javorcik 2018).

The two-part model comprises a participation equation for y_1, where

$$y_1 = \begin{cases} 1 \; if \; y_1^* > 0 \\ 0 \; \text{if} \; y_1^* \leq 0 \end{cases} \tag{5.1}$$

and an expenditure equation for y_2, where

$$y_1 = \begin{cases} y_2^* \; \text{if} \; y_1^* > 0 \\ - \; \text{if} \; y_1^* \leq 0 \end{cases} \tag{5.2}$$

y_1^* determines whether the household participates; y_2^* determines the amount spent; and $y_1^* \neq y_2^*$. To generate a vector of inverse mills ratio, the selection equation is estimated by maximum likelihood as an independent probit model (Greene, 1993, chap. 22) to determine the decision to participate using information from the full sample (those who spend and those who do not). Household spending is only observed when the selection equation equals 1 (household participates) and is then regressed on the covariates (which can now encompass other tourism-related variables), and the vector of the IM ratios from the selection equation by OLS. Also, the second stage runs the regression with the estimated error included as an extra explanatory variable, removing the part of the error term correlated with it.

The equation used for both stages are given as follows.

$$\begin{aligned} Y_{i1} = \alpha_{i1} + \beta_1 ATR_{i1} + \beta_2 lnIncome_{i1} + \beta_3 Higher\ education_{i1} + \beta_4 Single_{i1} \\ + \beta_5 Employed_{i1} + \beta_6 Densely_{i1} + \beta_7 Intermediate_{i1} \\ + \beta_8 Female_{i1} + \beta_9 Children_{i1} + \beta_{10} NOHM_{i1} + \beta_{11} Age_{i1} \\ + \beta_{12} Age\ square_{i1} + \beta_{13} Adriatic_{i1} + \beta_{14} Alpine_{i1} \\ + \beta_{15} Baltic_{i1} + \beta_{16} Danube_{i1} + \beta_{17} AMIncome_{i1} + \beta_{18} GDP_{i1} \\ + \beta_{19} DCPS_{i1} + \beta_{20} ROL_{i1} + \beta_{21} GOE_{i1} + \beta_{22} COC_{i1} + \beta_{23} RQI_{i1} \\ + \beta_{24} VAI_{i1} + \beta_{25} PSI_{i1} + u_{i1} \qquad (5.3) \end{aligned}$$

$$\begin{aligned} & lnExp_{i2} \\ & = \delta_{i2} + \gamma_1 lnTAX_{i2} + \gamma_2 [ln(TAX) * Children]_{i2} + \gamma_3 [ln(TAX) * Single]_{i2} \\ & + \gamma_4 [ln(TAX) * Female]_{i2} + \gamma_5 [ln(TAX) * AMIncome]_{i2} + \gamma_6 lnIncome_{i2} \\ & + \gamma_7 Higher\ education_{i2} + \gamma_8 Single_{i2} + \gamma_9 Employed_{i2} + \gamma_{10} Densely_{i2} \\ & + \gamma_{11} Intermediate_{i2} + \gamma_{12} Female_{i2} + \gamma_{13} Children_{i2} + \gamma_{14} NOHM_{i2} \\ & + \gamma_{15} Age_{i2} + \gamma_{16} Age\ squared_{i2} + \gamma_{17} Adriatic_{i2} + \gamma_{18} Alpine_{i2} + \gamma_{19} Baltic_{i2} \\ & + \gamma_{20} Danube_{i2} + \gamma_{21} AMIncome_{i2} + \gamma_{22} GDP_{i2} + \gamma_{23} DCPS_{i2} + \gamma_{24} ROL_{i2} \\ & + \gamma_{25} GOE_{i2} + \gamma_{26} COC_{i2} + \gamma_{27} RQI_{i2} + \gamma_{28} VAI_{i2} + \gamma_{29} PSI_{i2} + \gamma_{30} IMR_{i2} \\ & + v_{i2} \qquad (5.4) \end{aligned}$$

Where equation 5.3 is the selection equation and Y_{i1} is a latent variable corresponding to the binary variable indicating tourism expenditure ($Y_i = 1$ if the household participates in domestic tourism activities and $Y_i = 0$ otherwise), and equation 5.4 is the OLS regression, whereby $lnExp_{i2}$ is the household expenditure on tourism. $\beta_1 \ldots \beta_{25}$ and $\gamma_1 \ldots \gamma_{30}$ represent the parameters of each variable to be

estimated which include socio-demographic characteristics of the household as well as economic and political control variables i.e., Rule of Law index (ROL), Government Effectiveness Index (GOE), Control of Corruption index (COC), Regulatory Quality Index (RQI), Voice and Accountability Index (VAI), Political Stability Index (PSI), and economic variables such as Real GDP per capita, and Domestic Credit to Private Sector. IMR is the inverse mills ratio and ATR is the average reduced VAT rate on main tourism services such as renting hotel accommodation, transport of passengers – domestic, transport of passengers - international air and sea, transport of passengers - international others, admission to cultural services, admission to amusement parks, restaurant and catering services, and admission to sporting events. Also, to be interpreted as elasticities and also due to their non-normal error distribution, consumption, income, and tax variables were log-transformed. Expenditure and tax were log-transformed following Cameron and Trivedi (2010).

Location is relevant in domestic tourism participation and spending. This is because proximity to tourist attractions can positively influence participation, but not necessarily expenditure. Moreover, the farther a household lives from tourist attractions, the less likely they are to participate and spend. Consequently, to assess tourist behaviour in different parts of the EU, the four EU macro-regions (*EUMacro*) were considered. According to the European Commission (2017), the EU macro-regions are classified into Adriatic-Ionian (Croatia, Greece, Italy, and Slovenia), Alpine (France and Germany), Baltic Sea (Denmark, Estonia, Finland, Latvia, Lithuania and Poland), and Danube (Bulgaria, the Czech Republic, Hungary, Slovakia and Romania). Other EU countries not grouped into the four macro-regions are also considered and include the UK, Spain, Belgium, Cyprus, Ireland, Luxembourg, Malta, and Portugal. These regions were first included in the large sample before being considered individually.

5.4. Data

5.4.1 EU Household Budget Survey and Macro level Data

A cross-sectional data is used to test the hypothesis. To construct this cross-sectional data, however, two types of data and sources are used. The first is the 2010

Household Budget Survey (HBS) provided by Eurostat, which is the statistics division of the European Commission. HBSs are national surveys concentrating primarily on household consumption. They are collected in all EU member states and their essential point (particularly at the national level) is to compute the consumer price index record. They were propelled in most EU member states toward the start of the 1960s, and Eurostat has been examining and distributing HBS data at regular intervals since 1988. The two last available datasets were made available for the years 2005 and 2010. The survey covers random samples of households collected from residents only and does not include foreign tourists. The HBS for the EU is particularly relevant for this study, as it enables a comparison to be made across countries. Domestic tourism expenditure and tax paid on tourism services are both captured in the survey. The reference person for qualitative variables is the household head as reported in the survey and refers to the person who contributes most to the household income. Also, only households that are identifiable by their size are included in the sample. Hence, our final sample size is comprised of 25 EU countries totalling 272,788 households[4].

5.4.2 Profile of EU households

A little above half of the households have female heads (52%), and 48% were male. In terms of the age of the representative household head, there is nearly an equal spread across the various age ranges. However, a majority of the respondents (30%) were between 40-59 years of age. They were followed by people between 20-39 (24%), and by those older than 59 years of age (23%) and those less than 19 years old (23%). Single and non-single household heads represented 46% and 47%, respectively. The majority of households (65%) did not have children 16 years old or younger living in the same household, yet 35% of the households reported one child or several children residing in their household. In terms of income level, 46% of the households reported household income above the national median, whereas 54% of the households earn below it. Only 24% of the household heads have higher education (this includes post-secondary tertiary education as well as tertiary

[4] Belgium (7,162); Bulgaria (2,982); Croatia (3,460); Cyprus (2,702); Czech (2,932); Denmark (2,477); Estonia (3,631); Finland (3,551); France (15,730); Germany (53,926); Greece (3,512); Hungary (9,936); Ireland (5,877); Italy (22,246); Latvia (3,796); Lithuania (6,098); Luxembourg (3,491); Malta (3,730); Poland (37,227); Portugal (9,489); Romania (31,336); Slovakia (6,143); Slovenia (3,923); Spain (22,184); and UK (5,247).

education first and second stages), while 56% have lower education. In terms of employment status, 40% of the household heads are employed, while 42% are not. The travel-related characteristics investigated included the number of household members and location density. The majority of the households have members of 1 (24%), 2 (33%), 3 (18%), and 4 (15%), while households who have between 5-17 (9%) household members are significantly lower. Concerning the location, a high percentage (39%) of households live in densely populated regions of the EU, 26% live in sparsely populated areas, while 23% live in intermediately populated regions.

5.4.3 Description of Variables

Table 5.1. Description of Variables

Variables	Level of data	Description	Mean
Tax-related Variables and Income			
ATR	Country level	This is the reduced average VAT tax rate on main tourism services	11.675
Tax	Household level	This is the amount of tax paid measured in Euros (€).	169.082
AMIncome		1 = the household income is above the median of the sample; 0 = otherwise	0.459
Income		Household net income measured in Euros (€).	25165.38
Household Socio-Demographic Characteristics			
Higher education	Household level	1 = household head has higher education; 0 = otherwise	0.303
Single		1 = Single; 0 = otherwise	0.494
Employed		1 = Employed; 0 = otherwise	0.489
Densely		1 = Densely populated (at least 500 inhabitants/km^2); 0 = otherwise	0.446
Intermediate		1 = Intermediate (between 100 and 499 inhabitants/km^2); 0 = otherwise	0.255
Female		1 = Female head of household; otherwise = 0	0.522
Children		1 = Household with children; 0 = otherwise	0.353
NOHM		Number of the Household member is the household size	2.538
Age		Age of household head	52.126
Economic and Political Control Variables			
GDP	Country level	Gross Domestic Product measured in constant 2010 U.S. dollars.	31127.750
DCPS		Domestic credit to the private sector	88.859
ROL		The index for Rule of Law	1.003

Variables	Level of data	Description	Mean
GOE		The index of Government Effectiveness	0.928
COC		The index for Control of Corruption	0.878
RQI		The index of Regulatory Quality	1.145
VAI		The index for Voice and Accountability	1.043
PSI		The index of Political Stability and Absence of Violence/Terrorism	0.638
GI		This is the average of six governance indices including rule of law; Government effectiveness; Control of corruption; Regulatory quality; Voice and accountability; and Political stability	0.939

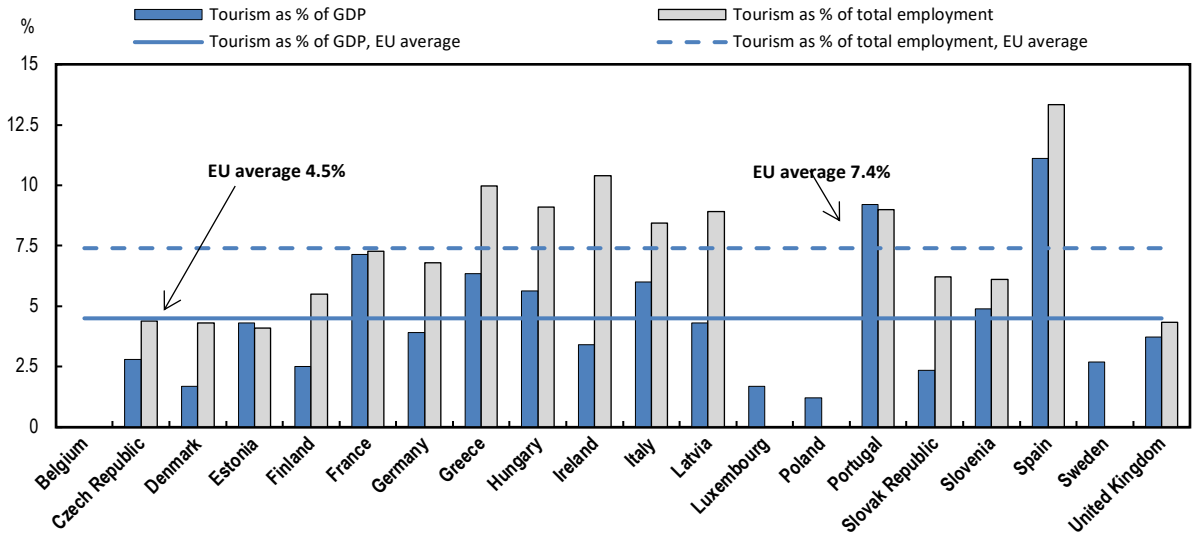
The variables employed in the empirical analysis are listed in Table 5.1. The dependent variable in the first stage is a dummy variable that represents the decision to participate ($dy = 1$) or not ($dy=0$), and the dependent variable in the second stage is household expenditure. Explanatory variables include tourism tax, income, and household socioeconomic characteristics. Spending on domestic tourism includes all household spending on admission to cultural services, amusement parks, museums, zoological gardens, and sporting events. This also covers the consumption expenditure by a visitor or on behalf of a visitor, for, and during, their stay at a destination. Household participation and non-participation is captured in the HBS by the number of zeros in domestic spending. From our data, 19% (51,355 households) did not participate in domestic tourism in 2010, and for those who participated, the expenditure was measured in euros (€). A logarithmic transformation was performed on tourism expenditure, tourism tax, and household income, to enhance the normality of the data and enable the measuring of elasticity. Sociodemographic variables include employment, AMIncome (the level of household income either above or below the median for each country in the sample), education, marital status, location (proxied by population density level), gender, family life cycle (children or no children), and age of the household head.

5.4.4 Tourism Tax and Macroeconomic Trends in the EU

The second data type includes country-level data on VAT rates and data on the number of domestic trips, the source of which were the Eurostat database (Appendix A.1), and other economic and political data is extracted from the World Bank Database. On average, tourism directly contributes 4.5% of GDP to the EU

economy and generates 7.4% of employment (Fig. 5.1), which has been sustained at this rate or even higher since 2014. Countries like Spain, Italy, Poland, and Greece outperform the EU average and are also notable holiday destinations for travellers from all over the world. More specifically, 10 EU countries recorded tourism contributions which were less than the EU average. Additionally, in the EU, domestic tourism accounts for almost half of internal tourism consumption. On average, domestic, and inbound tourism accounts for 49% and 51% of internal tourism consumption respectively, in selected EU countries (Fig. 5.2). Also, considering internal tourism consumption by product, accommodation (28%), followed by passenger transport (19%), and food and beverages (14%), account for well over half of the total consumption. In terms of domestic tourism, culture, sports, and recreation comprise 7% of the total consumption. There are also considerable differences in the significance of domestic tourism consumption among EU countries. Domestic tourism is significant in Germany, the United Kingdom, Italy, France, Denmark, and Sweden, where it represents over 60% of internal tourism consumption. On the other hand, in Estonia, Croatia, Slovenia, Poland, Hungary and the Czech Republic, inbound tourism is over 60% of internal tourism consumption.

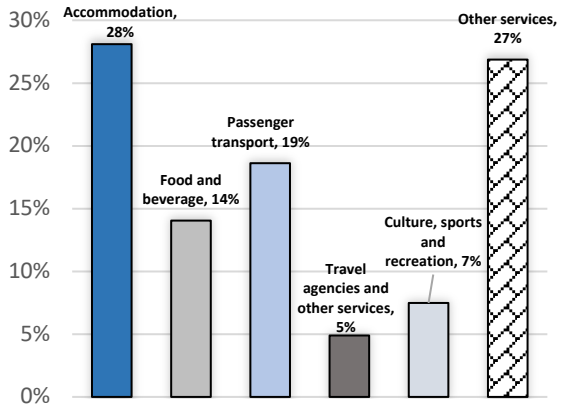
Fig. 5.1: Direct contribution of tourism to EU countries (as a percentage of GDP and employment, 2016 or latest year available)



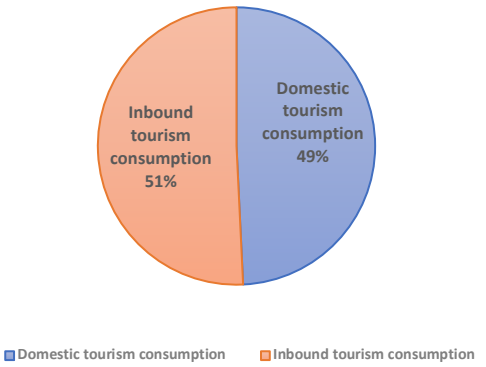
Source: Author

Figure 5.1. Internal tourism consumption selected EU countries

Tourism consumption by product



Domestic and Inbound tourism.



Source: Author

5.4.4.1 Tourism Tax in the EU

Value-added tax (VAT) is a prerequisite for membership of the European Union. However, the adopted VAT rates differ among the European countries, leading to a decrease in the efficiency of the VAT system and an increase in administrative and compliance costs (Charlet and Owens, 2010). As theoretically and empirically demonstrated in the 2007 Copenhagen Economics study, the VAT system can benefit, in terms of efficiency, if a uniform standard VAT rate is adopted by the EU members and if reduced VAT rates are applied to some specific sectors (Copenhagen Economics, 2007). The Sixth VAT Directive regulated the EU VAT system until 2007, after which a new VAT Directive was introduced (European

Commission, 2006). The new VAT Directive stated that EU members could adopt one standard VAT rate, ranging between 15% and 25%, and a maximum of two reduced rates of at least 5%. A lower reduced rate is allowed for the EU countries that, at the 1st of January 1991, had already adopted a lower rate than the minimum indicated in the VAT Directive (European Commission, 2006).

The European Commission also introduced the possibility of applying a reduced VAT rate on some specific labour-intensive industries in 1999 (European Commission, 1999). Focusing on the tourism sector, admission to shows, theatres, circuses, fairs, amusement parks, concerts, museums, zoos, cinemas, exhibitions, and similar cultural events and facilities, the accommodation provided in hotels and similar establishments, including the provision of holiday accommodation and the letting of places on camping or caravan sites, were classified as labour-intensive industries, while restaurant services were excluded. In 2007, the average standard VAT rate among members of the EU was approximately 20%, with a maximum rate of 25% in Denmark, and a minimum rate of 15% in Luxemburg. After the global financial crisis of 2007/2008, the average standard VAT rate increased by 2% (from 20% to 22%), with a maximum rate of 27% in Hungary and a minimum rate of 17% in Luxemburg. The most significant increase (7%) in the standard VAT rate was recorded in Hungary (moving from 20% to 27%), a group of European countries, viz. Malta, Germany, Austria, Bulgaria, Belgium, Denmark, have not changed the standard VAT rate over the years, and Latvia is the only country that has reduced the standard rate by 1%, going from 22% in 2007 to 21% in 2015.

Hence, when reviewing VAT systems in the tourism sector adopted by the EU countries, several different scenarios can be identified, since some goods and services are produced by labour-intensive industries while others are not. In particular, three of the main domestic tourism services i.e. admission to cultural services (shows, cinemas, theatres), admission to amusement parks, and hotel accommodation, are considered labour-intensive industries, and therefore, countries can choose to adopt either the standard rate or two different reduced rates.

In figure 5.3, how VAT rates have evolved in the EU between 2007 and 2015 is summarized for each tourism sector analysed. In each subfigure, EU countries are grouped into 6 clusters, as follows:

a) countries that chose to abolish the reduced rate (RR) in favour of the standard rate (SR) during the period under analysis

b) countries that chose to adopt the SR for the whole period

c) countries that chose to adopt the RR in place of the SR during the period under analysis

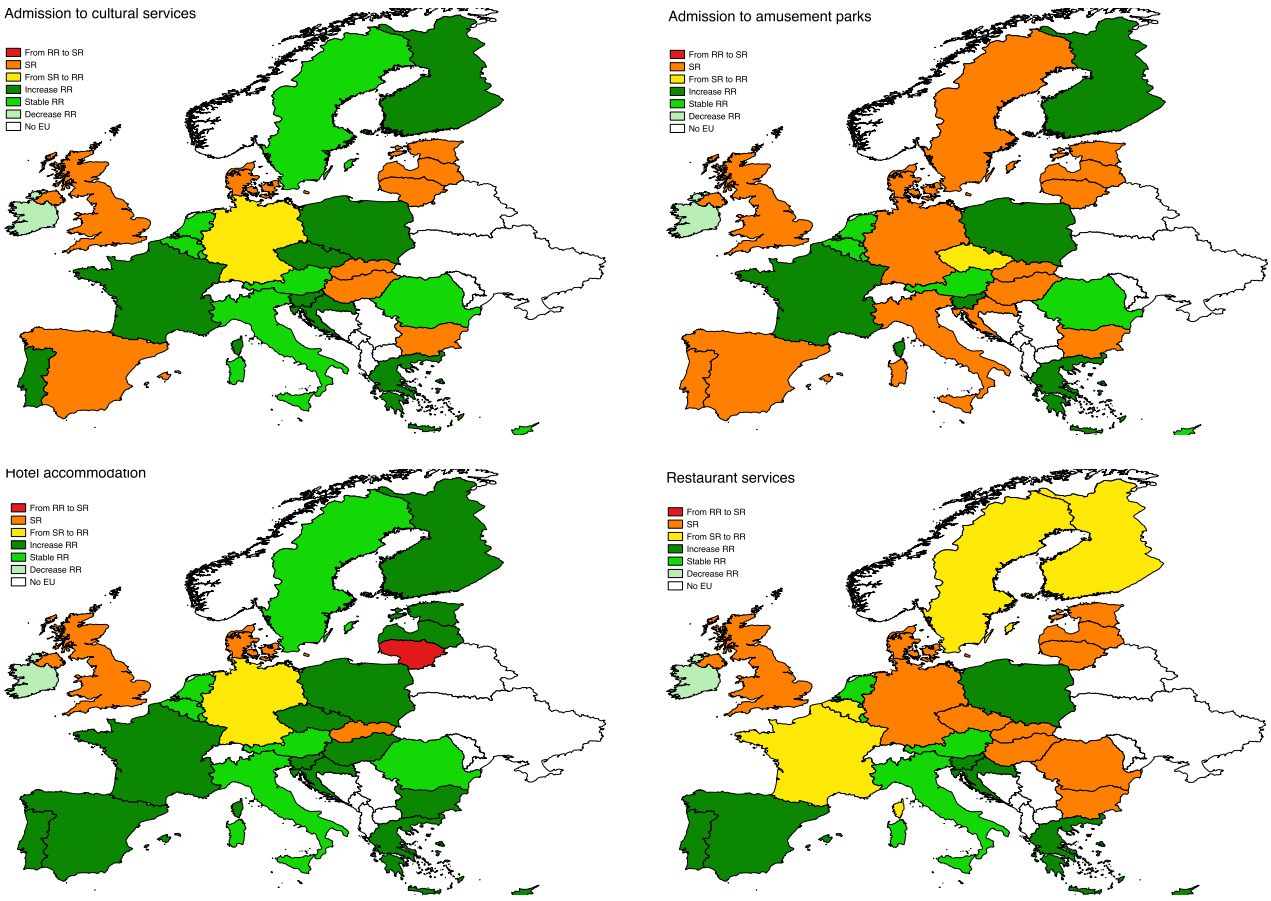
d) countries that chose to increase the RR over the years

e) countries that have maintained a stable RR

f) countries that chose to decrease the RR over the years

It was ascertained that only Ireland decided to decrease the RR in the period under consideration. Specifically, the Irish government opted to decrease the RR from 13.5% in 2007 to 9% in 2015 in all tourism industries considered. Denmark, Slovakia, and the UK chose not to apply the RR in the tourism sector, instead of adopting the SR of 25% in Denmark (this rate has kept constant since 2007), and 20% in Slovakia and the UK in 2015 (in 2007 the SR was respectively equal to 19% and 17.5%).

Figure 5.3: Evolution in the VAT rate from 2007 to 2015 among the EU countries regarding the four major tourism industries



Source: Author

Additionally, Lithuania joined this group of countries in 2009 when the government decided to abolish all reduced VAT rates (Bikas and Saikevicius, 2010). Therefore, Lithuania increased the RR in hotel accommodations from 5% in 2007 to 9% in 2011, until the adoption of the SR of 21% in 2012. Focusing on the labour-intensive tourism industries, it is evident that 10 countries out of 23 have adopted a homogeneous VAT policy over the years in each of the three industries considered. In particular, Austria, Belgium, Luxemburg, the Netherlands, and Romania have kept the RR unchanged to a rate ranging from 3% (Luxemburg) to 10% (Austria). The remaining 5 countries (Greece, Finland, France, Poland, and Slovenia) increased the RR by diverse percentages that differ among the three industries. In contrast, Malta adopted a different VAT policy in the three industries, maintaining a 5% RR on admission to cultural services, adopting the SR in the admission to amusement parks, and increasing the RR from 5% to 7% in 2011 for the hotel accommodation industry. Moreover, fewer countries have adopted a homogeneous

VAT policy only for two out of three industries. In particular, 6 countries have adopted a common VAT policy in the admission to cultural services and admission to amusement parks industries. The majority have adopted an SR and only Cyprus has kept constant the RR adopted in these two industries. Meanwhile, all of them have increased the RR for the hotel accommodation industry. The remaining 6 countries have instead adopted a uniform regional VAT policy but differ with regards to the admission to cultural services and hotel accommodation industries.

5.5. Results and Discussion

The results of the marginal effects of the probit estimation as well as the second stage, truncated regression is presented in table 5.2. Both models include the tourism tax variable, socio-demographic variables, and economic and political control variables that influence a households' decision to participate and spend on domestic tourism in the EU. Both the log pseudolikelihood and the Hosmer-Lemeshow statistic confirm that the probit model is a good fit to the data. Additionally, the squared predictions (_hatsq) is not significant, which shows that the model is specified correctly for each model which represents the two stages of the decision. The first part of the two-part model is a binary outcome equation that models $Pr\ (Y_{i1} > 0)$, while the second part utilises the OLS regression to model $E\ (lnY_{i2} \mid Y_{i2} > 0)$. These two parts are assumed to be independent and are estimated individually. The F statistic and the Inverse Mills Ratio (IMR) are statistically significant ($\alpha = 0.001$). The coefficient of the IMR suggests that estimating the two stages independently (i.e., separating the decision to participate and expenditure in the two-part model) eliminates the risk of any sample selection bias.

Table 5.2. Results of First and Second stage Models

Variables	Marginal Effects of Probit Estimation	OLS regressions
	dy	*Log (Exp)*
Average Reduced VAT	-0.003*** (0.001)	
Log (Tax)		0.539*** (0.003)
Log (Tax) * Children		-0.127*** (0.003)
Log (Tax) * Single		0.051*** (0.003)
Log (Tax) * Female		-0.034*** (0.003)
Log (Tax) * AMIncome		-0.210***(0.003)
Log (Income)	0.142*** (0.002)	0.468*** (0.014)

Higher education	-0.006*** (0.002)	-0.026*** (0.009)
Single	-0.017*** (0.002)	-0.172*** (0.017)
Employed	-0.007*** (0.002)	0.018 (0.011)
Densely	0.054*** (0.002)	0.252*** (0.011)
Intermediate	0.021*** (0.002)	0.126*** (0.012)
Female	0.007*** (0.001)	0.106*** (0.016)
Children	0.046*** (0.002)	0.615*** (0.020)
Number of Household Members	-0.003*** (0.001)	0.047*** (0.005)
Age	0.0006** (0.0002)	-0.0005 (0.001)
Age Squared	-6.80e-06*** (0.000)	4.33e-06 (0.000)
Adriatic	-0.234*** (0.033)	-1.042*** (0.091)
Alpine	0.039*** (0.007)	0.045** (0.018)
Baltic	-0.079*** (0.022)	-0.501*** (0.091)
Danube	0.012 (0.026)	-0.923*** (0.101)
Average Median Income	-0.007** (0.002)	0.444*** (0.020)
Real GDP per capita	-1.08e-07 (0.000)	2.23e-05***(0.000)
Domestic credit to the private sector	-0.002*** (0.000)	-0.002*** (0.0003)
Rule of law index	0.123*** (0.015)	0.469*** (0.062)
Government effectiveness index	0.029** (0.012)	-0.847*** (0.057)
Control of corruption index	0.095*** (0.018)	-0.547*** (0.093)
Regulatory quality index	-0.396*** (0.021)	0.893*** (0.065)
Voice and accountability index	-0.253*** (0.019)	-0.853*** (0.067)
Political stability index	0.168*** (0.009)	-0.064** (0.030)
Constant		0.0314 (0.171)
Observations	165,603	165,603
Post-estimation tests and checks		
LR $\chi 2$	25691.24***	
Hosmer-Lemeshow chi-square	10913.59[a]	
Pseudo R-squared	0.1935	
R-squared		0.735
Inverse Mills Ratio		-3.576*** (0.015)
F		23866.59***
Model specification test: P-value of _hatsq	0.113	0.172

NB: [a] denotes Hosmer-Lemeshow chi-square statistic with $p > chi^2$ not significant. Robust Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

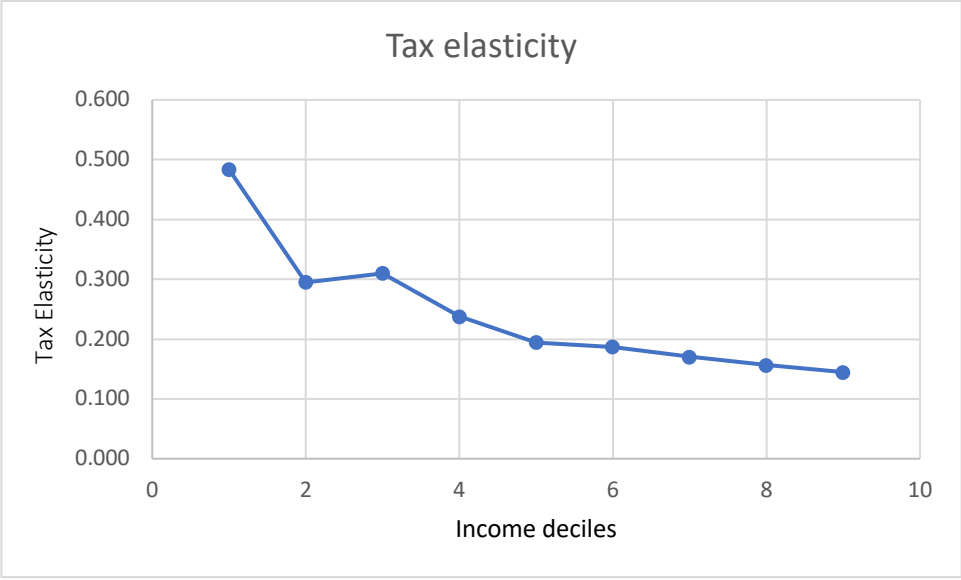
Table 5.2 depicts the results of the first and second estimation of coefficients in the double hurdle model. All the variables that are used to assess the effects of tourism tax are significant, implying that tourism tax influences domestic tourism expenditure. Although the effect of tourism tax is considered only at the expenditure stage of tourist decision, the average rate of VAT levied on tourism services shows a significant impact on the tourist participation decision. In other words, the tourism tax variable in the first stage shows that the higher the tourism tax levied on tourism services, the less willing households are to participate in domestic tourism activities in the EU. This suggests that the propensity to participate is negatively influenced by the VAT rate levied on tourism services. One implication of a high tourism tax rate is the potential for a redistribution effect of tourism participation, which indicates that participation in domestic tourism is sacrificed for increased outbound tourism. This redistribution effect differs from that of Song et al. (2019), in which expenditure is considered, and outbound tourism is replaced by increased domestic tourism as a result of Air Passenger Duties (APD) levied in the UK. The distributional effects of a tourism tax in this study enabled due to tourist decisions about their general opinion and attitudes towards holiday costs. Households will prefer outbound tourism to domestic tourism if the former is less expensive. This behaviour is captured by psychographic variables e.g. behavioural factors such as motives for travelling, extemporaneous decision making, and first-time or repeat visits (Saayman and Saayman, 2012), and has been widely assessed in the tourism literature. Apart from perceptions about destination choice and tourist expenditure at destinations, Um and Crompton (1990) have also demonstrated how the perception of the destination affects households' choice of participation in tourism activities and travel expenditure. Thus, higher tourism tax rates can be considered regressive, particularly when international destinations are viewed as relatively less expensive for households with children.

Conversely, in the expenditure stage, tourism tax paid has a positive effect on domestic tourism expenditure. Specifically, a 1% increase in tourism tax paid leads to a 0.54% increase in domestic tourism expenditure. However, as illustrated in figure 4, the responsiveness of domestic tourism expenditure to fluctuations in tourism tax paid (tourism tax elasticity) decreases at higher income deciles. This

means that there is a high degree of heterogeneity in terms of tourism tax impact, given that it shows varying levels of impact based on the income decile households belong to. Households in higher income brackets have lower tourism tax elasticity, ranging from 0.10 for households at the lowest income decile to 0.50 for the highest. In this context, notwithstanding their heterogeneity, all the households in the sample, irrespective of their income decile, have a tourism tax elasticity which is less than 1.

Consequently, this result proposes that a significant change in tourism tax paid would have a minimal impact on tourism expenditure for the entire example of EU households, with higher-income households being progressively less sensitive to changes in tourism tax paid. The impact of tourism tax on domestic tourism also depends, however, on the incidence of tax. This means that the burden may fall heavily upon tourists, more than it falls on providers of tourism goods and services – a case which has been demonstrated in the literature (Bonham, et al. 1992). This may also be made possible when the activities of tour operators are considered. In this case, the bargaining power of tourists may be weakened when tourism services are consumed on-site, rather than prior purchase of tourists' packages. Hence, where tourists are likely to ultimately bear the burden when tourism taxes are levied, a well-designed system of tourist taxation is vital.

Figure 5.4. Tourism tax elasticities on tourism expenditure by income deciles



Although it can be inferred that charging higher tourism taxes may increase the household budget share allocated to domestic tourism services within countries in the EU, this is not the case for all categories of domestic tourists. Hence, to further divide the result, four moderating effects are also examined:

a) household life cycle (with or without children)

b) marital status

c) gender

d) below or above the median income

Households with children are found to constrain the effect of tourism tax on domestic tourism expenditure; that is, for those households with children, the positive effect of tourism tax is weakened. A 1% increase in tourism tax reduces household tourism expenditure by 0.13%. The moderating effect of children is important and stems from the fact that tourism expenditure by households with children is limited by several factors. For example, time in taking care of the children with considerations for shorter trips, school calendars, age requirements, and greater food and transport costs (Cai et al., 1995). Hence, household expenditure patterns for tourism products and services could be largely influenced by the presence of children due to the cost of the travel and activities they choose to participate in. The majority of studies that assess the family life cycle as a determinant of tourism expenditure found no significant impact (Brida and Scuderi, 2013; Alén et al., 2014). However, Alegre et al. (2009) showed that tourism expenditure is higher for households without children than for households with children. For domestic tourism, Bel et al. (2014) found that households with children are more involved in tourism activities, but older tourists without children spend more on visits to tourist attractions. Given the foregoing, tourism tax is observed to be significant for households with children when spending on domestic tourism.

The impact of tourism tax is also moderated by marital status. Although the direction of the impact remains positive, the level of impact on tourism expenditure is reduced from 0.54% to 0.05% for a 1% increase in tourism tax. Marital status carries significant weight and typically determines the relative proportion of household budget being allocated to tourism expenditure due to the higher

accommodation, transportation, and feeding costs. According to Hong et al. (2005), married household heads without children are more likely to spend on tourism and they spend significantly higher than singles. Hence, since a 1% increase in tourism tax corresponds with a less than 1% (inelastic) increase in domestic tourism expenditure, the reactions of single household heads to the increase can also be considered relatively modest. That is, because the overall impact of tourism tax on tourism expenditure is lower for all household in the sample, it has a much weaker effect on singles.

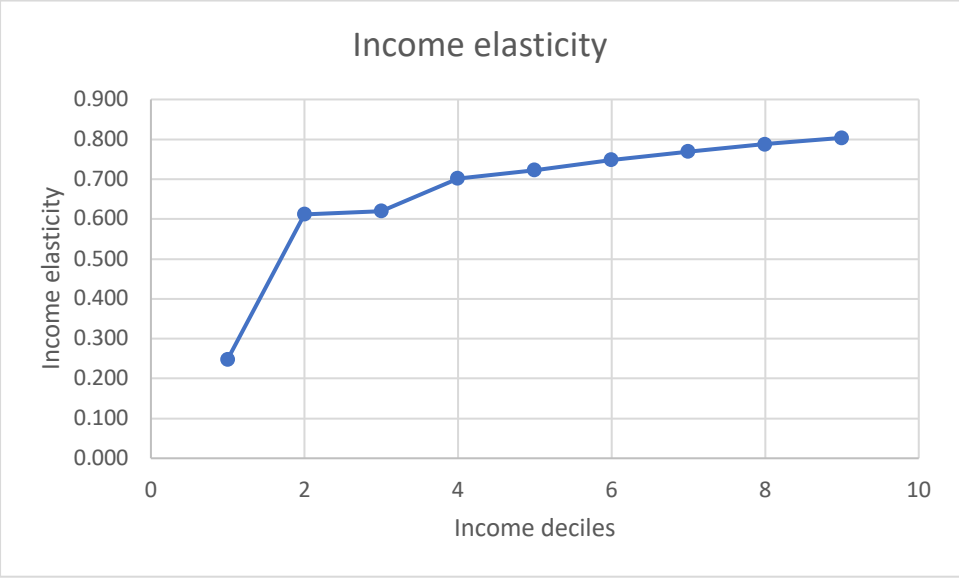
The positive effect of a tourism tax in the second stage of the household decision is again lower but negative for females. A 1% increase in tourism tax led to a 0.03% decrease in the domestic expenditure by households with female heads. This moderating negative effect of the female household head implies that they have a greater awareness of tourism taxes and are likely more resistant to spend on domestic tourism due to the influence of the tax, as they may find the taxes an important consideration for total cost when planning their budget. Additionally, as part of the moderating effects, the category of household income is also included. According to Alegre and Pou (2004), income above the median is significant determinants of the probability to consume tourism products and services. Consequently, as mentioned previously, households in this study were divided into two income classes: above and below-median income. The motivation for this is to assess whether any differences exist in how the two-income class value spending on domestic tourism when tourism taxes are considered. Results show that for a 1% increase in tourism tax, households with income above the median lead to a decrease in domestic tourism expenditure by 0.21%. This implies that domestic tourism is less valued by higher earners.

5.5.1 Other control variables

The impact of household income variable was determined to be significant and positive in both stages, which suggests that the more income earned by a household, the more likely they are to participate and spend on domestic tourism. This is in line with previous studies that assess the determinants of tourist expenditure (Alegre et al., 2013; Marrocu et al., 2015; Disegna and Osti, 2016; Salgado-Barandela et al., 2018). Specifically, a 1% increase in household income will result in a 0.5% increase in domestic tourism expenditure. However, the change in

tourism expenditure as a result of the fluctuation in income varies across income deciles. Figure 5.5 depicts the income elasticity on tourism expenditure at different household income deciles to demonstrate households' high level of heterogeneity, with income having a varying impact on tourism expenditure contingent upon the income decile. More comprehensive analysis shows that the higher the level of household income, the higher the income elasticity, with elasticities that range from a value of 0.25 for the least income decile to 0.80 for the highest income decile. In this manner, despite their heterogeneity, all the household in the sample, whatever their income decile, have an income elasticity that is less than 1. Consequently, these outcomes propose that a significant increase in income would decrease domestic tourism expenditure by only a small amount for the entire sample of EU households, with higher-income households being less sensitive to income changes. One of the explanations for the decrease in domestic tourism spending is the substitution of domestic for foreign holiday destinations as income rises. Furthermore, these values of elasticity are, however, lower than estimates from previous studies. For example, Alegre and Pou (2004) found that for tourism consumption, the income elasticity varies alongside several other socio-demographic factors, and the elasticity is less than 1.

Figure 5.5. Income elasticities on tourism expenditure by income deciles



The direct impact of sociodemographic variables is tested and are all statistically significant in both stages, except for employment and age in the second stage. In the first stage, a single representative household head with employment and higher

education is less likely to participate in domestic tourism in the EU. However, female household heads with children who live in either a densely or intermediately populated region have a greater probability of participating in domestic tourism than male household heads without children who live in sparsely populated regions. Additionally, families with older household heads whose total earnings are above the median income and live either in the Adriatic or Baltic regions are less likely to participate in domestic tourism. Moreover, the higher the number of household members, the less likely EU households will participate in domestic tourism. In terms of economic and political controls, households who live in EU countries with higher domestic credit to the private sector, regulatory quality and voice and accountability, are also less likely to participate in domestic tourism.

However, with the higher rule of law, government effectiveness, control of corruption, and political stability indices, households have a greater likelihood of participating in domestic tourism. In the second stage, there is a 5% increase in expenditure for an additional household member involved in domestic tourism. Spending on domestic tourism by higher-income households with female heads who have children and live in densely or intermediately populated regions within the EU is higher by 44%, 10%, 61%, 25% and 13% respectively when compared to lower-income households with a male head who do not have children and live in sparsely populated regions within the EU. Furthermore, single household heads with lower education who live in countries in the Adriatic, Baltic and Danube EU-macro regions spend less on domestic tourism than married household heads with higher education compared to married household heads with higher education who live in 'other' regions in the EU. In terms of economic and political controls, households who live in EU countries with higher domestic credit to the private sector, government effectiveness, control of corruption, voice and accountability, as well as political stability, spend less on domestic tourism, while households who live in EU countries with higher real GDP per capita and better regulatory quality have a higher level of domestic tourism expenditure.

5.5.2 EU macro-regions

Location plays an important role in tourism participation and expenditure since the probability of participation increases when people live closer to tourist sites,

recreational grounds, and cultural attractions. However, the amount spent on these activities may not necessarily be influenced by location. In the tourism literature, the location has been captured by nationality, region, or country of residence, and is shown to be a significant determinant of tourism expenditure (Brida and Scuderi, 2013). Results from the total sample in table 5.2 show the different impacts across the EU regions. In the first stage, the propensity to participate in domestic tourism is lower for EU households who live in the Adriatic-Ionian (Croatia, Greece, Italy, and Slovenia) and the Baltic Sea (Denmark, Estonia, Finland, Latvia, Lithuania, and Poland) regions than households who live in 'other' EU regions (the UK, Spain, Belgium, Cyprus, Ireland, Luxembourg, Malta, and Portugal). Conversely, EU households who live in the Alpine (France and Germany) and Danube (Bulgaria, the Czech Republic, Hungary, Slovakia, and Romania) regions are more likely to participate in domestic tourism than those who live in the aforementioned 'other' EU regions. In the second stage, EU households who live in the Adriatic, Baltic and Danube regions spend less on domestic tourism, while EU households who live in the Alpine regions spend more on domestic tourism than EU households who live in the 'other' regions. The notable difference is further analysed to assess how tourism tax, income, and sociodemographic features differ across the EU macro-regions.

Table 5.3. Results of Marginal Effects of Probit Estimation

Dependent variable: *dy*	Adriatic-Ionian	Alpine	Baltic Sea	Danube	Others
	Croatia, Greece, Italy, Slovenia	France, Germany	Denmark, Estonia, Finland, Latvia, Lithuania, Poland	Bulgaria, Czech, Hungary, Slovakia, Romania	UK; Spain; Belgium; Cyprus; Ireland; Luxembourg; Malta; Portugal
Average Reduced VAT	0.181***	0.0140***	-0.0682***	-0.0417***	0.0417***
	(0.00974)	(0.000798)	(0.00113)	(0.00201)	(0.00268)
Log (Income)	0.224***	0.0784***	0.140***	0.178***	0.0620***
	(0.0112)	(0.00274)	(0.00537)	(0.0104)	(0.00384)
Higher education	0.00161	0.00330*	-0.00681	0.00249	-0.0175***
	(0.0117)	(0.00194)	(0.00513)	(0.00767)	(0.00466)
Single	-0.00820	0.00172	-0.000238	-0.00596	-0.0156***
	(0.00926)	(0.00214)	(0.00474)	(0.00652)	(0.00496)
Employed	0.00421	-0.00379	-0.00197	-0.0115	0.00392

	(0.00973)	(0.00242)	(0.00523)	(0.00760)	(0.00525)
Densely	-0.00625	0.00938***	0.0872***	0.0595***	0.0673***
	(0.0105)	(0.00286)	(0.00447)	(0.00681)	(0.00508)
Intermediate	0.0122	0.000643	0.0121*	0.0333***	0.0341***
	(0.0107)	(0.00291)	(0.00713)	(0.00698)	(0.00560)
Female	-0.00451	-0.000789	-0.00569	0.0170***	0.00531
	(0.00878)	(0.00189)	(0.00426)	(0.00609)	(0.00433)
Children	0.0653***	0.0186***	0.0765***	0.0631***	0.0351***
	(0.0107)	(0.00298)	(0.00585)	(0.00865)	(0.00621)
Number of Household Members	-0.0222***	-0.0118***	-0.0118***	-0.0280***	0.0419***
	(0.00423)	(0.00127)	(0.00228)	(0.00352)	(0.00276)
Age	-0.000646	-2.93e-05	-0.000219	0.000469	-0.000464
	(0.00122)	(0.000285)	(0.000621)	(0.000950)	(0.000663)
Age Squared	5.14e-06	-1.04e-07	2.53e-06	-5.74e-06	2.07e-06
	(1.02e-05)	(2.41e-06)	(5.26e-06)	(7.92e-06)	(5.54e-06)
Average Median Income	0.0575***	0.00256	0.0152***	0.0151	0.0888***
	(0.0123)	(0.00342)	(0.00551)	(0.0101)	(0.00615)
Economic and Political Controls	Yes	Yes	Yes	Yes	Yes
Observations	17,280	51,081	42,176	15,621	39,445
Pseudo R^2	0.2799	0.1652	0.2523	0.1460	0.1640

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Tables 5.3 and 5.4 present the marginal effect estimation results for tourism participation and spending respectively across EU-Macro regions. In terms of participation in domestic tourism, only tourism tax, household income, the presence of children, and the number of household members is a significant determinant of participation in tourism in all of the regions, while age and employment are not significant determinants of tourism spending in all the EU macro-regions. As shown in figure 5.6, the responsiveness of domestic tourism expenditure to changes in income is highest in the Adriatic, 'others', and Baltic Sea regions, followed by the Alpine and Danube regions.

Table 5.4. Results of the Second stage truncated OLS regressions

Dependent Variable: *log (Expenditure)*	Adriatic-Ionian	Alpine	Baltic Sea	Danube	Others
	Croatia, Greece,	France, Germany	Denmark, Estonia, Finland,	Bulgaria, Czech, Hungary,	UK; Spain; Belgium; Cyprus; Ireland;

	Italy, Slovenia		Latvia, Lithuania, Poland	Slovakia, Romania	Luxembourg; Malta; Portugal
Log (Tax)	0.972***	0.217***	0.741***	0.788***	0.514***
	(0.00979)	(0.00499)	(0.00709)	(0.00974)	(0.00624)
Log (Tax) * Children	-0.0806***	0.0462***	-0.134***	-0.0915***	-0.192***
	(0.0116)	(0.00470)	(0.00690)	(0.00946)	(0.00595)
Log (Tax) * Single	0.0218**	0.0261***	0.0114*	0.00111	0.00206
	(0.0104)	(0.00437)	(0.00614)	(0.00757)	(0.00615)
Log (Tax) * Female	-0.00377	-0.00225	0.0148**	-0.0291***	-0.00945
	(0.0109)	(0.00419)	(0.00606)	(0.00756)	(0.00600)
Log (Tax) * AMIncome	-0.330***	-0.179***	-0.108***	-0.212***	-0.333***
	(0.0141)	(0.00429)	(0.00650)	(0.0106)	(0.00598)
Log (Income)	0.987***	0.339***	0.451***	0.168***	0.726***
	(0.0495)	(0.0372)	(0.0233)	(0.0334)	(0.0205)
Higher education	0.0594	-0.0182*	-0.0353*	0.0149	-0.0322
	(0.0539)	(0.00996)	(0.0187)	(0.0197)	(0.0239)
Single	-0.0470	-0.106***	-0.0727**	0.00492	-0.000407
	(0.0571)	(0.0239)	(0.0321)	(0.0360)	(0.0331)
Employed	0.0877**	0.0323***	-0.0292	0.0175	0.0366
	(0.0441)	(0.0120)	(0.0189)	(0.0173)	(0.0273)
Densely	0.127***	0.165***	0.130***	0.146***	0.430***
	(0.0429)	(0.0152)	(0.0168)	(0.0187)	(0.0295)
Intermediate	0.115**	0.0527***	0.191***	0.0278	0.208***
	(0.0483)	(0.0154)	(0.0227)	(0.0173)	(0.0316)
Female	0.00860	0.00410	-0.0608*	0.103***	0.0374
	(0.0559)	(0.0227)	(0.0310)	(0.0355)	(0.0300)
Children	0.786***	0.0259	0.718***	0.508***	0.543***
	(0.0722)	(0.0288)	(0.0390)	(0.0470)	(0.0374)
Number of Household Members	-0.181***	-0.0128	-0.0415***	-0.0340***	0.140***
	(0.0208)	(0.0123)	(0.00795)	(0.00988)	(0.0123)
Age	-0.00751	-0.000417	-0.00163	-9.95e-05	-0.00135
	(0.00589)	(0.00149)	(0.00225)	(0.00229)	(0.00330)
Age Squared	6.90e-05	6.49e-06	9.17e-06	7.31e-06	1.83e-05
	(4.80e-05)	(1.24e-05)	(1.91e-05)	(1.90e-05)	(2.79e-05)
Average Median Income	0.957***	0.635***	0.210***	0.650***	0.249***
	(0.0762)	(0.0421)	(0.0348)	(0.0512)	(0.0341)
Economic and Political Controls	Yes	Yes	Yes	Yes	Yes

Inverse Mills Ratio	-1.090***	-4.026***	-1.416***	-2.191***	-4.898***
	(0.0865)	(0.0254)	(0.0338)	(0.0709)	(0.0413)
Constant	-6.725***	-1.676***	36.44***	-3.572***	-3.488***
	(0.398)	(0.409)	(1.453)	(0.244)	(0.245)
Observations	17,280	51,081	42,176	15,621	39,445
R-squared	0.641	0.809	0.788	0.910	0.664

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The impact of tourism tax paid on domestic tourism participation is positive in the Adriatic, Alpine and 'others' regions, but negative in the Baltic Sea and Danube regions. This means that households who live in the Adriatic, Alpine and 'others' regions are more likely to participate in domestic tourism activities despite the tourism tax paid on tourism services, while the reverse holds for households who live in the Baltic Sea and Danube regions. In other words, the more taxes are paid for tourism services, the lesser the participation in tourism activities. In the second stage, tourism tax elasticity is positive and highest in the Adriatic region, followed by the Baltic Sea, Danube, 'others' and Alpine region, as illustrated in fig. 5.7. Specifically, tourism tax elasticity is unitary, which suggests that a 1% increase in tourism tax will result in an equal increase in domestic tourism expenditure in Croatia, Greece, Italy, and Slovenia. The response is much lower in France and Germany, with only a 0.22% increase in tourism expenditure for a 1% increase in tourism tax paid. However, the impact of tourism tax paid on tourism expenditure in these regions is moderated by the presence of children, whether the household is above the median income, and the characteristics of the household head, such as marital status and gender.

Figure 5.6. Income elasticity across EU macro-regions

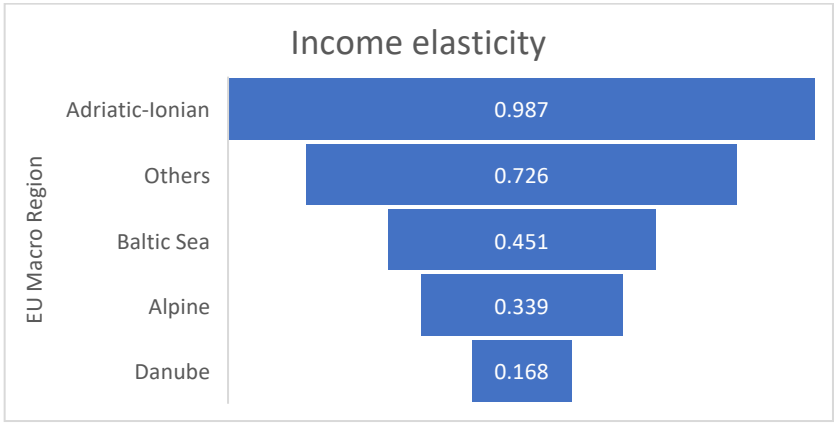
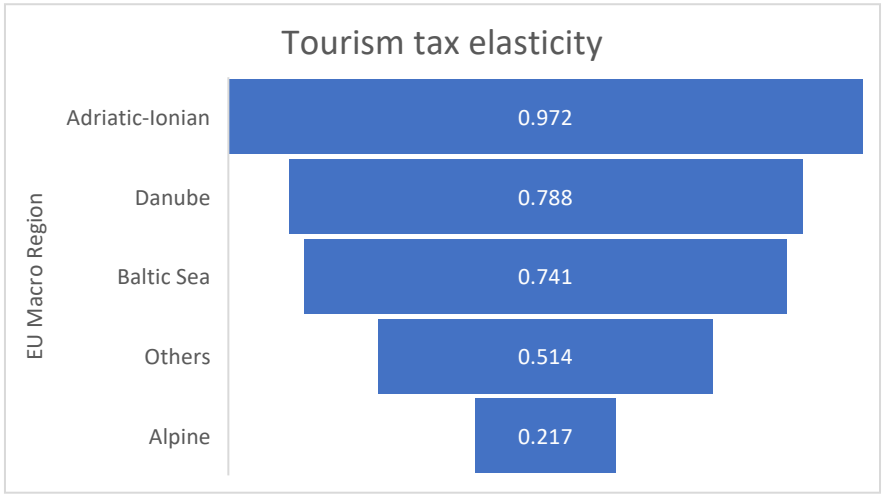


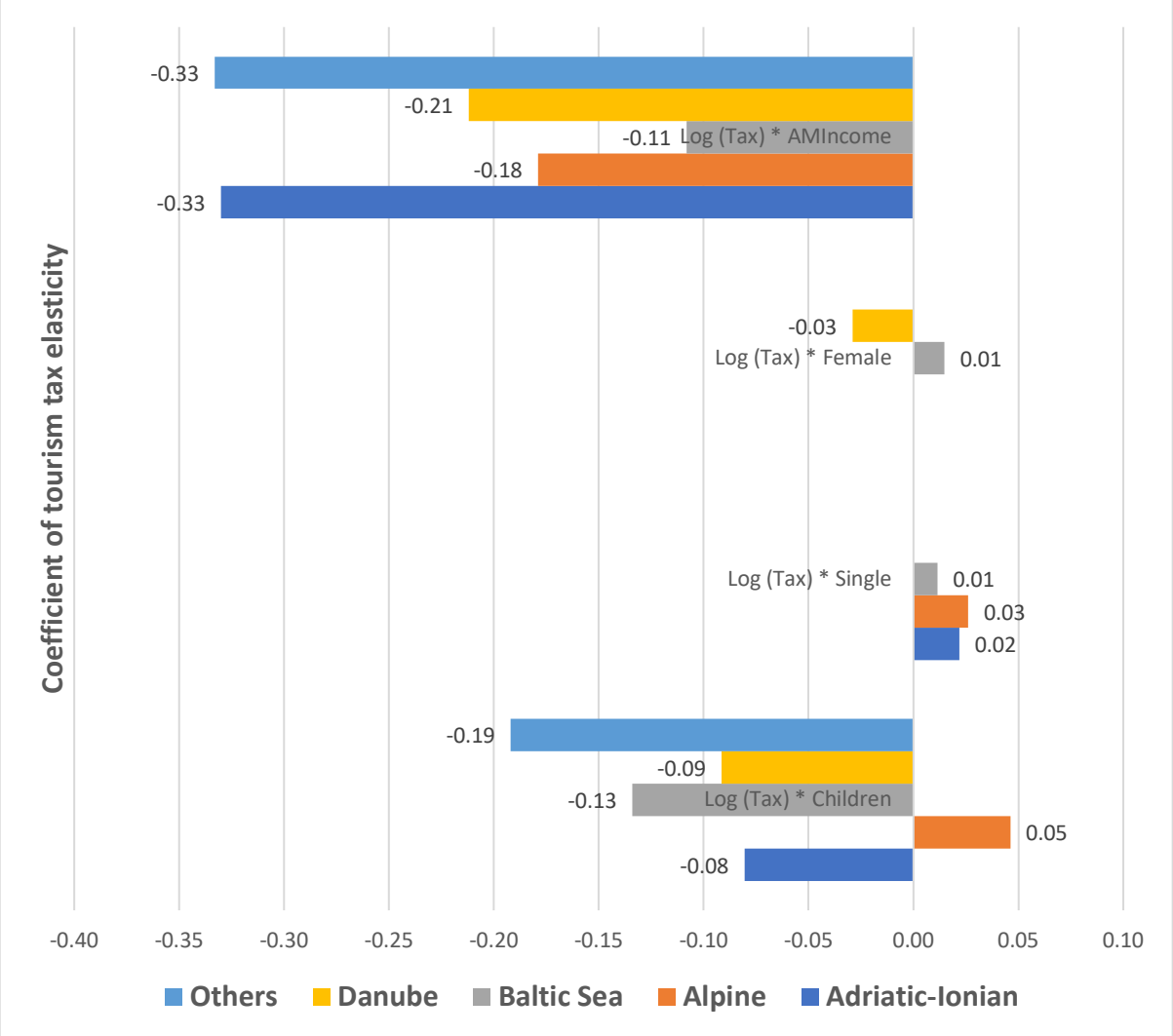
Figure 5.7. Tourism tax elasticities across EU macro-regions



Unlike in the total EU household sample, the moderating effect of children on tourism tax impact is negative in all regions except in France and Germany where it is positive but lower than the absolute value. This indicates that in most EU regions, households with children reduce spending on domestic tourism as tourism tax increases more than households without children. Furthermore, as shown in figure 5.8, single household heads in the EU increase spending on domestic tourism as they pay more in tourism taxes, more than married household heads, but this result does not hold in two EU macro-regions. This suggests that marital status does not moderate the impact of tourism tax on domestic tourism expenditure in the Danube and 'other' regions. The gender of the household head presents a unique result, as it only moderates the effect of a tourism tax in the Baltic Sea and Danube regions. Interestingly, with a 1% increase in tourism tax, female household heads decrease domestic tourism expenditure by 0.03% in the Danube region but increase spending by 0.01 in the Baltic Sea region. Among the sociodemographic features considered, household income class moderates the impact of a tourism tax in all EU

macro-regions. This demonstrates the significance of income as a determinant of tourism expenditure. Across the EU macro-regions, households with income above the median decrease expenditure as tourism tax increases. Specifically, for a 1% increase in tourism tax, households above the median income decrease domestic tourism spending by 0.33% in both the Adriatic and 'other' regions than households below the median income. This impact is lower in the Danube, Alpine, and Baltic Sea regions.

Figure 5.8. Moderating effect of household sociodemographic features on the tourism tax impact



5.6. Conclusion, implications, and limitations

The focus of this study was to evaluate the impacts of tourism tax on domestic tourism spending in the European Union (EU) countries. The impact of tourism tax on tourism expenditure is an under-researched topic in the tourism demand

literature. A few recent studies have attempted to investigate the impact of tourism taxation on tourist behaviour at a microeconomic level, particularly with regards to willingness-to-pay (Seetaram et al., 2018) and tourist budget allocation (Song et al., 2019). However, since most studies focus on the macroeconomic determinants of tourism demand, the impact of tourism taxes has only been analysed as a component of travel intensity and expenditure (Seetaram et al., 2014). Barely any examinations have explored how tourism tax influences household tourism participation and spending behaviours. This study proposes that the impact of tax collection on a households' tourism decisions and spending plans is of imperative monetary significance to both the local and international tourism industries. In particular, this investigation models the impact of tourism taxation on the organization of the domestic tourism industry in the EU. The choice of domestic tourism is largely due to data availability.

Rather than concentrating on budget allocations, redistribution, or the willingness-to-pay for tourism taxes, this study analyses the impact of tourism tax on household participation and domestic tourism expenditure. To achieve this, Eurostat's 2010 Household Budget Survey (HBS) is used and a two-part model is applied following previous research (Jang and Ham, 2009; Disegna and Osti, 2016; Lyu and Noh, 2017), which suggests that household behaviour in terms of domestic tourism can be modelled in a two-step framework. First, households decide whether to engage in domestic tourism. This was modelled using the probit technique. Secondly, the amount to expend was modelled in the second stage using the truncated OLS technique. The results show that in the first stage model, higher tax rates on tourism services may dissuade tourists from participating in domestic tourism services, although higher tourism tax corresponds to greater tourism expenditure in the second stage. This finding supports previous studies that adopt macro data on specific tourism taxes with the policy recommendation of an increase in tax on tourism services (Blake, 2000; Gooroochurn and Sinclair, 2003, 2005; Gago et al., 2009; Aguiló et al., 2012; Falk and Hagsten, 2018). However, a high tourism tax has implications for domestic tourism planning decisions across the European Union (EU) as well as tourism marketers and fiscal policymakers at large.

Therefore, in a microeconomic model of tourism tax, considering only the absolute impact of tourism tax may be misleading, as several household composition and

sociodemographic features are material. For example, for households above the median income with children, and households with a female head, the positive direct impact of tourism tax becomes negative, denoting that these categories of tourists respond negatively to an increase in tourism tax. However, single household heads decrease domestic tourism expenditure as tourism tax rises. Hence, for domestic tourism marketing strategies in the EU, stakeholders need to consider unique strategies for different groups and family life cycle which can be addressed separately; one policy for households with children who live above the median income and is headed by a female on the one hand, and single households on the other. The information from this research will be beneficial to government investment in tourism services and will support tourism businesses.

Furthermore, the negative micro level impact of tourism tax paid on tourism expenditure when household sociodemographic features are considered aligns with studies that assess the macro level impact of tourism taxes (Dwyer et al., 2012; Seetaram et al., 2014; Arguea and Hawkins, 2015). This arises because households tend to reallocate their tourism spending plans in manners that have distributional impacts at a global level. For instance, the head of a household with children may designate a bigger portion of their total household income to outbound tourism for long period holidays once a year with the children due to demands of travelling. Single households, on the other hand, may choose to reallocate their household income to several domestic tourism activities within a year. A higher tourism tax can constrain tourists to pay for the expanded costs by diminishing the share of total household budget allocated to domestic tourism in subsequent holidays. One deduction from this is that the additional expense of a tourism tax has an altogether negative effect on the spending share for essential consumptions of tourism services (such as renting hotel accommodation, transport, admission to cultural services, admission to amusement parks, restaurants and catering services, and admission to sporting events).

In terms of the sociodemographic characteristics of the household, the utility is maximized through different participation decisions, as shown by the results of this study; hence, tourism policies should target these unique outcomes. For instance, results show that older household heads are less likely to participate compared to households with younger heads, and the location is also significant as households

who live in densely and intermediately populated regions are more likely to participate in domestic tourism than households who live in sparsely populated regions. This information is relevant for tourism marketers. Specifically, marketing strategies can be addressed equally to all household types regardless of location, particularly those with children who live in sparsely populated regions to enhance the level of participation in domestic tourism. Most of the results (e.g. gender, education, number of household members) were consistent with similar studies (Cai, 1998, 1999; Hong et al., 1999, 2005). Also, tourism policies in different EU macro-regions would differ significantly from one another as a result of the disparate results in the determinants of tourism participation, and expenditure in the macro-regions is also important for tourism policy in the EU.

Overall, this study provides additional corroboration of the impact of tourism tax policies on households in the EU. The findings show that a high tourism tax can discourage households from participating in domestic tourism activities, although those who do participate may spend more as tourism tax rises. However, when households are classified into certain sociodemographic groups, higher tourism tax leads to lower domestic tourism spending. Consequently, since the impact of tourism tax might be weakened if household sociodemographic features are considered, households typically become mindful of tourism taxes.

The limitations of the study are primarily related to the data employed. Since the survey covers only 2010, household behaviour may have changed if compared with either the 2005 or 2015 HBS survey (currently unavailable). Future research in this area may assess accommodation choice and spending decisions by domestic and/or international tourists in Italy where tourism tax is considered before deciding where to stay and how much to pay. Moreover, people may look more at the idea of the price (how much it costs rather than the tax rate). This is because it can only be part of the decision-making process if it is included/transmitted to the final price. Consequently, in this study, the accounting memory of consumers is with the price and not necessarily the tax.

Chapter Six. The Impact of Taxation on International Arrivals in Small Economies Dependent on Tourism

6.1. Introduction

Within tourism research, there has been unrelenting attention on the role of government policies on issues such as climate change, investment in infrastructure, demand forecasting, and sustainability, as well as the impact of such policies on travellers and the wider tourism industry. Specifically, one such public policy is the levying of direct and indirect taxes on tourism services (Mak 2006). Tourism taxes are charged by the government at different levels on tourism products or directly to tourists (UNWTO 1998). In general, tourism taxes include entry and exit taxes such as visas, travel permits or resident departure taxes; air travel tax such as air passenger duty or airline fuel tax; airports, seaports and road border charges; road taxes, gambling; value-added taxes on restaurants, coaches, car rental, visitor attractions, training, and hotels, or accommodations such as bed tax and occupancy taxes; and environmental taxes (UNWTO 1998, p. 32). However, in recent times, these taxes have increased to include new user charges, fines, and fees. In line with government policies, many destinations seem to charge these taxes to *"expand and diversify their tax base; export taxes to non-resident tourists; tax away excess profits or economic rents from tourism to benefit residents; or to correct for market failure"* (Mak, 2006, p. 253), hence, it is critical to assess the impact of tourism tax on the economy.

Despite government's justification for imposing tourism taxes, Bakhat and Rosselló (2013) (Spain), Mayor and Tol (2007) (UK), and Seetaram et al. (2014) (UK) all suggest a reduction or removal of tourism tax due to its negative impact on the tourism industry. Palmer and Riera (2003) also advocate for the abolishment of tourism taxes, asserting it is merely an instrument to generate additional revenue. However, other studies such as Falk and Hagsten (2018) in the case of Austria, and Gago et al. (2009) in the case of Spain, demonstrate a need to either introduce tourism taxes or increase the rate of existing tourism taxes. In the case of tourism-dependent economies, Gooroochurn and Milner (2005) argue for the imposition of tourism taxes because it is a socially efficient means of generating tax revenue. While in the case of small island economies, Sinclair et al. (2005) demonstrate mixed impacts, with an increase in tourism taxes bringing in more revenue, but

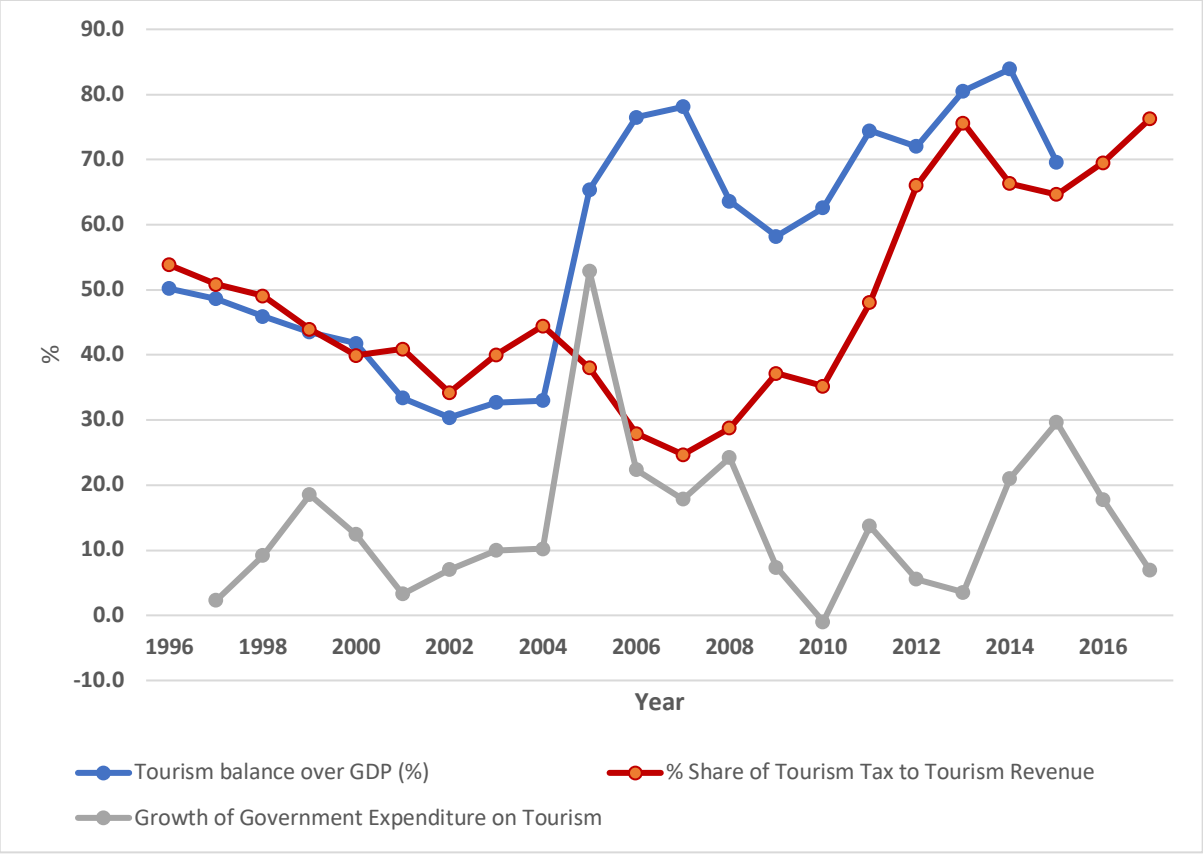
eroding resources from efficient to inefficient sectors. Thus, the current study argues that merely imposing tourism taxes is not a sophisticated tool of public policy in countries that largely depend on tourism if the objective of such countries is to boost inbound tourism and by extension contribute to their economic development. Moreover, a mix of tourism tax policies tends to raise tax revenue but can have a detrimental impact on the economy, with a specific focus on tourist arrivals and competitiveness.

Therefore, this study aims to develop a tourism demand model for international travellers to the Maldives to assess the effect of tax policies on tourist flows. This paper contributes to research on tourism taxation in two aspects. Firstly, there are insufficient studies on the impact of tourism tax on international tourist arrivals, to which this study will contribute. Secondly, this study reports a tourist tax impact on inbound tourism from individual source markets to an Island destination, which remains an underdeveloped area of research despite the volume of academic literature on tourism demand. Apart from notable studies on environment-related tourism tax (Forsyth et al. 2014, Seetaram et al. 2014), there are few papers on general tourism taxation (Ponjan and Thirawat 2016), but none which focus on a tourism-dependent country. To achieve the aim of this study, panel cointegration analysis and a fully modified ordinary least squares (FMOLS) method are employed using yearly data from 1996 to 2017 for the 20 tourist originating countries which account for 81% of total international tourist arrivals. They are China, Germany, the United Kingdom, Italy, India, Russia, France, Japan, the U.S.A., the Republic of Korea, Australia, Austria, Malaysia, Saudi Arabia, Singapore, Spain, Sri Lanka, Sweden, Switzerland, and Thailand.

As a small island economy dependent on tourism, this paper illustrates that the volume of inbound tourism to the Maldives is adversely affected by tourism tax and is a protracted problem that requires careful modelling and analysis of public policy options rather than crude and unsophisticated policy instruments such as introducing new tourism taxes or increasing the rate of existing ones. It is worth noting that the Maldivian economy is a small island economy with capacity constraints in its public sector and is geographically remote with limited land area and a narrow resource base. As such, the Maldives has gone through a series of structural changes due to its vulnerability to exogenous shocks. For example, the

fall in international tuna prices between 1999 and 2000 combined with the cost of oil imports almost doubling contributed to the introduction of a costly recovery and reconstruction program which merely resulted in huge fiscal deficits (Asian Development Bank 2011). Consequently, tourism was ultimately determined to be the largest industry in the Maldives, with an average tourism balance over GDP of a little above 50% within two decades (see fig. 6.1).

Figure 6.1. Contribution of tourism to the economy of Maldives

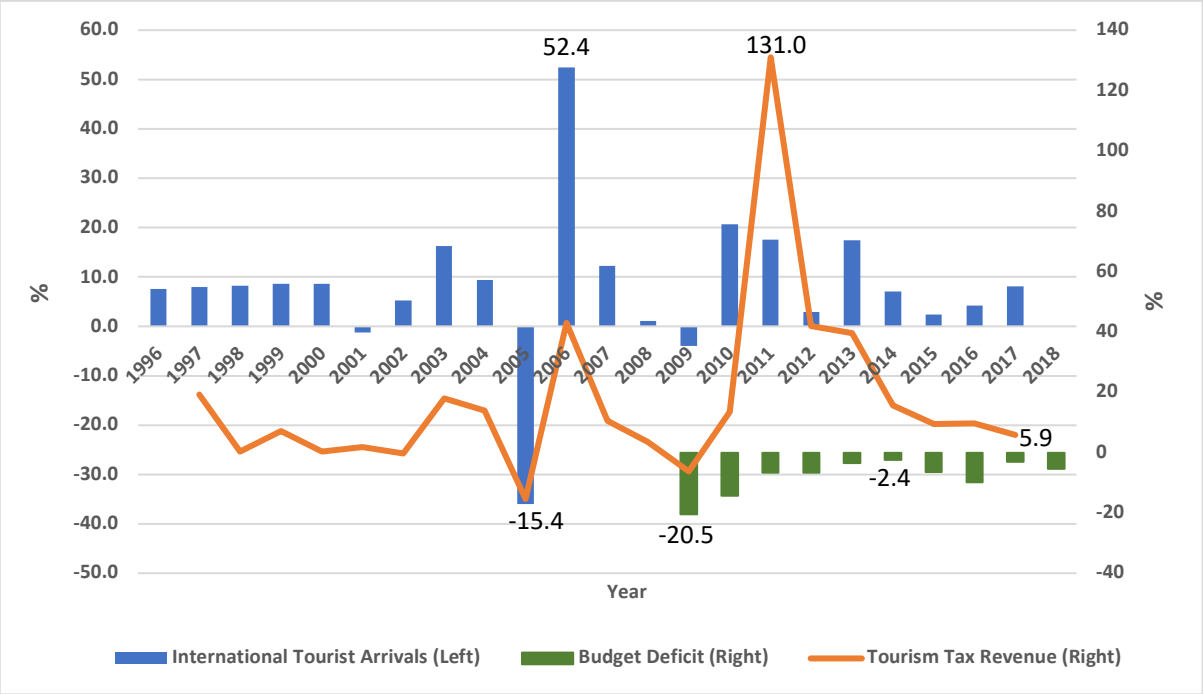


Data source: UNWTO and Ministry of Tourism, Maldives

With a growing tourism industry, the government of the Maldives introduced certain economic instruments including changes in fiscal policy, and in particular, the introduction of taxes on the tourism industry, not matched by a significant increase in government expenditure (see fig. 6.1). Tourism taxes have evolved significantly in the last two decades with the main aim of raising direct income for the government. From 1996 to 2004, tourism tax revenue was limited to a bed tax of US$6 charged from all tourist-accommodating establishments (such as resorts/marinas, hotels, guest houses, and safari vessels) for every night spent by a tourist (Ministry of Tourism 2001). With tourism revenue as the major source of

foreign earnings to the Maldivian economy, and contributing 29% of the GDP, the government increased the bed tax to US$8 in 2004. This increase was, however, quickly followed by the tsunami disaster of December 2004, thereby necessitating a mix of expansionary fiscal policies. Apart from the 52% increase in government spending on the tourism industry, the government relaxed resort lease rent and bestowed 100% duty exemption on imports to those resorts that were damaged by the disaster. As shown in figure 6.2, following the shock to the tourism industry, tourism tax revenue dropped by 15.4% in 2005, but this decrease was outweighed by the 36% fall in international tourist arrivals.

Figure 6.2. Tourism Tax Revenue and Inbound Tourism in the Maldives (annual percentage change)



Data source: UNWTO and Ministry of Tourism, Maldives

Other policies to revamp the tourism industry to its pre-tsunami levels included intensive marketing campaigns and promotion with increased government budget. As a result, both international tourist arrivals and tourism tax revenue increased by 52.4% and 43.1% respectively. However, a new airport service charge of US$25 per passenger departing from an airport in the Maldives was levied in 2007, and another US$25 for airport development fee was levied in 2017 for every passenger departing from Velana International Airport. Although international tourist arrivals declined significantly in 2007 and 2008, the effectiveness of this tax policy is

questionable and ambiguous due to the global economic recession. In fact, since 2013, there have been further significant changes to the tourism tax policy in the Maldives. The tourism goods and sales tax (T-GST) was increased from 3.5% in 2011 to 6%, then 8%, and finally 12% between 2012 and 2014, accounting for over 50% of tourism revenue in 2014 (Ministry of Tourism 2018).

Whilst this reduced the budget deficit to -2.4% in 2014 (fig. 6.2), there was a subsequent increase in 2015 and 2016, which was attributable to the decrease in arrivals. Furthermore, the tourism bed night tax was abolished from the 1st of December 2014, and a Green Tax of US$6 was introduced on the 1st of November 2015. The T-GST is essentially a price instrument which is expected to influence the cost of a holiday in the Maldives, while the airport charges are included in the airline tickets. This has implications on transport cost and repeat-visits, as evidenced by the falling trend in the growth of international tourist arrivals (see fig. 6.2). Also, compared to other similar Island destinations dependent on tourism, these tax policies may hamper competitiveness, as the government of the Maldives introduces a new tourism tax every year (Maldives Times 2017). The issue this study examines is how these tourism taxes have influenced demand and whether they have made any significant difference to travel behaviour across different tourist markets of the Maldives, or are inbound tourists simply prepared to travel more?

The next section presents a review of the existing literature on taxation and tourism demand. The data used and a descriptive statistical analysis of this data is presented in section 6.3, followed by a detailed discussion of the econometric models and techniques used. Section 6.5 discusses the empirical findings of the long-run and short-run inbound tourism demand models and examines the estimated demand elasticities. Finally, section 6.6 concludes this chapter, highlighting future areas for research and some of the policy implications of the findings.

6.2. Literature Review

Within the global economy, the tourism industry has become strategically important and has experienced unprecedented and continuous growth in many countries. In 2018, the total international tourist arrivals grew by 7%, representing the highest growth in seven years since 2010, alongside a 5% increase in the total international tourism receipts globally (UNWTO 2018). While the US, Spain,

France, and the UK are among the top earners, the Maldives, British Virgin Islands, Macau, and Seychelles are largely reliant on revenue from the tourism industry as a major driver of economic growth. Also, with the further interconnectedness of economic unions and regions, tourism activities revolve around not only the movement of capital and labour for pleasure and business purposes but also stimulates investment in the infrastructure, human capital, and urbanization of tourism destinations and creates employment. Since tourism remains one of the major drivers of the global economy and a large contributor to international trade, its importance cannot be overemphasized. Thus, given the growth of tourism, it is pertinent to ask questions about the factors that affect international tourism demand, with specific emphasis on the gaps that exist in the literature.

Research on international tourism demand has increased substantially in the last two decades. Apart from research investigating tourism-growth nexus, studies on tourism demand have contributed significantly in the area of tourism economics (Peng et al. 2015, Song, Qiu, et al. 2019). The majority of these studies focus on examining the determinants of tourism demand, and in some cases, forecasting future tourist flows. Hence, in the literature, there are commonly used traditional determinants which include the income of the source country, relative prices, travel costs, exchange rates, and marketing expenditures (Lim 1997, Peng et al. 2015). However, recent research on tourism demand has also examined the importance of other factors such as migration, taxation, weather, climate change, investments in transport infrastructures, and crisis events such as terrorism, diseases, financial crises, and natural disasters (Álvarez-Díaz, González-Gómez, & Otero-Giráldez, 2019; Falk, 2014; Massidda & Piras, 2015).

Previous studies suggest that tourism taxes can significantly influence both inbound and outbound tourism demand. For instance, in the UK, a travel tax (air passenger duty) charged directly to residents for outbound tourism is expected to reduce departures (Seetaram et al. 2014). A similar result also holds in the case of Australia for a departure levy referred to as a ‘passenger movement charge’ (Forsyth et al. 2014). On the contrary, it was found that setting an emissions trading system aimed at increasing the cost of visiting the Caribbean from the EU does not necessarily reduce arrivals (Blanc and Winchester 2012). Seetaram, Song, Ye and Page (2018) show that tourists are willing to pay, and the demand elasticities moderate the

impact of tourism tax on tourism demand. Also, a lower accommodation rate do not ameliorate idle room capacity in Barbados (Palmer 1993). Although there is minimal research on taxation as a determinant of international tourist arrivals, the impact of various types of tourism taxes on the environment, tourism businesses, and the overall economy has been examined in the literature.

There is an ongoing debate on the impact of tax on tourism demand. While some studies report a negligible impact on tourist arrivals or argue against levying tourism taxes, other studies present a mixed result. Apart from the role of the incidence of a tourism tax, these mixed results arguably arise due to assumptions about the price elasticity of demand for tourism products (Forsyth et al. 2014); the market power of the destination (Sheng and Tsui 2009); or the share of tourism demand component of a commodity consumed by both domestic residents and tourists (Gooroochurn 2009). Another consideration is the form of a tourism tax in place – specific (such as carbon tax) or general (indirect tax such as VAT). Although the use of a specific tourism tax such as an air passenger duty is discriminatory and generates price distortions (Seetaram et al. 2014), other general tourism taxes like VAT increases the risk of tax evasion but can be welfare-enhancing with a slight modification on the equity effects when tourism taxes are levied on the consumption of luxury goods which are targeted at households (Gago et al. 2009).

There are other studies on tourism taxation which focus on environmental taxes. According to Sun (2016), the use of technically efficient means of production to reduce carbon emissions from tourism-based activities is superior to the government imposition of tourism taxes to correct for emissions which have negative externality. Also, there are growth effects on the economy which eventually decrease the environmental impacts of tourism-based activities (Qureshi et al. 2017). Furthermore, in accounting for tourism emissions, an important component of the environmental impacts of tourism is highlighted, which is the level of development of the tourism destination (Tao and Huang 2014). Thus, to mitigate the effect of tourism on the environment, the use of green technologies and the efficient management of tourism resources is recommended, but this is often more pronounced in developed than developing countries (Alam and Paramati 2017). Consequently, the literature suggests that there is a vacuum for investigating

the links between tourist flows, travel cost, and the tourism tax intended to correct for negative externalities. A summary of the information gleaned from the review of the existing literature is that an environmental-based tourism tax adversely affects key macroeconomic variables: slows down the growth of real GDP; contracts tourism output; and has a negative spill-over effect on the global economy (Dwyer, Forsyth, Spurr, et al. 2012). Additionally, tourism arrivals decrease due to an emissions trading system earmarked to curb negative the environmental effects of tourism (Blanc and Winchester 2012), but departures are not significantly affected by air passenger duty imposed as tourists tend to be willing to pay more for the environmental costs they generate (Seetaram et al. 2014, 2018).

Despite the existing studies on the impact of tourism tax on the economy, there is insufficient evidence about its impact on inbound tourism. Hence, the current study contributes to the research on tourism taxation in two aspects. Firstly, there are not enough studies on the impact of tourism tax on international tourist arrivals. Secondly, this study reports on the tax impact on inbound tourist arrivals from individual source markets to an Island destination, which remains an underdeveloped area of research despite the volume of academic literature on tourism demand. Apart from notable studies on environment-related tourism tax (Forsyth et al. 2014, Seetaram et al. 2014), there are few papers on general tourism taxation (Ponjan and Thirawat 2016), but none that focus on a tourism-dependent country.

6.3. Data

This study utilises panel data for analysis. Panel data is a distinct case of pooled time-series and cross-section in which the same cross-section (such as entities including states, companies, individuals, and countries) is measured over time. In this study, the cross-section includes a sample of the top 20 markets for inbound tourism in the Maldives, and yearly observations of several variables were collected from 1996 to 2017. In using panel data, this study adjusts for individual heterogeneity, obtains more informative data, and ensures variability, efficiency, and good degrees of freedom. Furthermore, this study benefits from the less collinear relationship among regressors. This leads to the building and testing of more complex behavioural models, and longitudinal unit root tests that possess standard asymptotic distributions. One limitation of panel data is the homogeneity

assumption, and though formal tests exist that would evaluate its validity, there is a possibility of cross-sectional dependence that would complicate the analysis. As such, certain methods and tests require balanced panels and cross-country data consistency.

Due to the availability of data, only international arrivals from the top 20 markets were selected. The markets are China, Germany, the United Kingdom, Italy, India, Russia, France, Japan, the U.S.A., the Republic of Korea, Australia, Austria, Malaysia, Saudi Arabia, Singapore, Spain, Sri Lanka, Sweden, Switzerland, and Thailand, with data from 1996 to 2017 (table 6.1). These countries account for the bulk (81%) of international tourist arrivals in the Maldives. The dataset is balanced as all countries have annual data for the period under consideration.

Table 6.1. International tourist arrival in the Maldives by country of origin (2017)

First top 10 markets				**Next top 10 markets**		
Rank	**Country**	**Share (%)**		**Rank**	**Country**	**Share (%)**
1	China	22.1		11	Switzerland	2.3
2	Germany	8.1		12	Australia	1.9
3	United Kingdom	7.5		13	Thailand	1.8
4	Italy	6.4		14	Spain	1.8
5	India	6		15	Austria	1.4
6	Russia	4.5		16	Saudi Arabia	1.4
7	France	3		17	Malaysia	1.3
8	Japan	3		18	Singapore	1
9	The U.S.A.	2.8		19	Sri Lanka	1
10	Republic of Korea	2.5		20	Sweden	1
	Sub-total	**66**			**Sub-total**	**15**

Source: (Ministry of Tourism 2018)

Variables are taken from several sources. The number of tourist arrivals is sourced from the UNWTO database. Tourism Tax is sourced from the Ministry of Finance & Treasury and the Maldives Inland Revenue of the Ministry of Tourism. It excludes lease rent from tourist resorts but includes the bed tax of US$6 charged from all tourist-accommodating establishments for every night spent by a tourist. The description of tourism revenue was adjusted in 2017 to include earnings received from Goods and Service Tax from the Tourism Sector (T-GST), the newly

introduced Green Tax, Tourism Land Rent and Lease Period Extension Fee. The resort lease rent formula was revised in 2011 from a bed capacity-based rent to a land-based rent, where US$8 is charged per square meter of the island. The T-GST, which was introduced in 2010 at a rate of 3.5%, was also increased to 6% from the 1st of January 2012, and subsequently, from the 1st of January 2013, it was again increased to 8%. From the 1st of November 2014, the rate was further increased to 12%. Whilst the tourism bed night tax was abolished from the 1st of December 2014, Green Tax was introduced on the 1st of November 2015.

Also, income is proxied by GDP per capita based on purchasing power parity (PPP) (US$). PPP GDP is the gross domestic product converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. GDP at purchaser's prices is the sum of the gross value added by all resident producers in the economy, plus any product taxes, and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets, or the depletion and degradation of natural resources. The data is in constant 2011 international dollars and is sourced from the World Bank.

Price is measured by a combination of the Consumer price index (CPI) (2010 = 100) and dollar exchange rate. The CPI reflects changes in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is typically employed. The data is expressed in period averages and is sourced from the World Bank's World Development Indicators. The dollar exchange rate is the local currency units per dollar. It is calculated as the official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar) and is sourced from the International Monetary Fund. The substitute price of a competitive and similar destination (Mauritius) is calculated using the CPI and the dollar exchange rate mix. The Caribbean, Seychelles and Mauritius are considered the alternative destinations to the Maldives. According to Shareef and McAleer (2008), Mauritius is located around the Indian Ocean and possesses very similar climatic features as the Maldives. Also, transportation costs from these tourist markets to Mauritius are

similar to the Maldives. A progressively exact technique for distinguishing a substitute market will be to examine the data on the main destinations for the tourists of each source market yearly. However, a huge volume of data would be required for this activity and is not accessible for the 22 years selected for this study.

The population is measured as each market's population size (million). It is the total population based on the de facto definition of the population, which counts all residents regardless of their legal status or citizenship. The values shown are midyear estimates and are sourced from the United Nations Population Division. Transport cost is omitted from this analysis as no appropriate indicator is available. A potential measure is the airfare from the main international airport of the origin countries to Velana International Airport in the Maldives (Seetaram and Dwyer 2009, Seetaram 2010, 2012, Dwyer et al. 2014, Seetaram et al. 2016). However, data on this was not available. Another popular consideration is the distance between the origin country and the Maldives. However, such proxy is time-invariant, and a fixed-effect model can adequately control for this.

6.3.1 Summary Statistics

Table 6.2 presents the descriptive characteristics of the variables considered in the empirical analysis i.e., tourist arrivals (number); tourism tax (million US$); relative income; price; substitute price and population. Tourism tax was an average of US$94.31 million between 1996 and 2017, with a minimum value of US$18.33 million and a maximum value of US$316.89 million. The average volume of tourist arrivals was 31,808 tourists with minimum and maximum values of 4,161 and 112,878 from Sweden and China respectively. One factor that may account for the difference in the volume of arrivals from these countries is the size of their population. For the complete sample, the average population over the period was 179.67 million, with minimum values from Singapore (4.65million) and maximum value from China (1,310.03million). However, Sweden also presented a low average population over the sample period. In terms of relative income measured by GDP per capita, the countries included in the sample recorded an average of US$32,257.75 within the period of the study, with minimum and maximum values of US$3,924.38 and US$64,296.99 from India and Singapore respectively. The average relative price was US$10.09 which was higher than the US$6.44 relative substitute price of an alternative destination, i.e., Mauritius. Additionally, both the

average relative price and substitute price were highest and lowest in the United Kingdom and South Korea respectively. Specifically, the relative and substitute price for South Korea was the same at US$0.01, nevertheless, the relative price was higher than the substitute price for the United Kingdom at US$27.67 and US$17.12 respectively.

Table 6.2. Summary Statistics

Individual Country Mean (1996 – 2017)					
	TA	I (US$)	P	SP	PO (million)
Australia	10761.09	39157.58	12.67	8.23	21.09
Austria	14520.91	41460.67	20.75	13.24	8.28
China	112878.5	7700.16	2.34	1.51	1310.03
France	39329.68	36055.36	20.75	13.19	63.56
Germany	81047.14	39481.68	20.92	13.30	81.92
India	24785.18	3924.38	0.31	0.20	1166.30
Italy	89154.23	35979.96	20.41	13.02	58.51
Japan	39225.45	35494.68	0.17	0.11	127.30
Malaysia	5543.409	19786.42	4.84	3.08	26.40
Russia	31623.14	19787.70	0.43	0.28	144.63
Saudi Arabia	5115.091	45685.53	4.40	2.82	25.33
Singapore	6551.818	64296.99	11.69	7.55	4.65
South Korea	16890.95	26734.16	0.01	0.01	48.67
Spain	9431.727	31354.81	19.97	12.77	43.95
Sri Lanka	9154.409	7617.00	0.12	0.08	19.74
Sweden	4161.818	40598.92	2.29	1.45	9.24
Switzerland	27940.45	53451.86	14.84	9.53	7.63
Thailand	5900.136	12125.92	0.47	0.30	65.53
United Kingdom	89994.64	35852.85	27.67	17.40	61.48
USA	12153	48608.34	16.83	10.68	299.12
Group Summary Statistics (1996 – 2017)					
Variable	Obs.	Mean	Std. Dev.	Min	Max
TA	440	31808.14	46501.78	198.00	363626.00
T (Million US$)	440	94.31	101.94	18.33	316.89
I	440	32257.75	16416.32	2342.58	85535.38
LP	440	10.09	9.44	0.01	36.51
LSP	440	6.44	6.13	0.01	21.81
LPO (million)	440	179.67	361.04	3.67	1386.40

6.3.2 Correlation Matrix

To show the descriptive relationship among variables, table 6.3 reports the coefficients of the correlation matrix for the log of tourist arrivals (LTA); lagged tourism tax (LT_{t-1}); relative income (LI); relative price (LP); substitute price (LSP) and population (LPO). The lagged dependent variable (LTA_{t-1}) is also included to account for the correlation between current and repeat visit. The result of the analysis indicates that the lagged dependent variable, tourism tax in the previous period, relative income, relative price, and population in the source country are positively correlated with tourist arrivals. At the same time, the substitute price has a negative association with tourist arrivals to the Maldives. Furthermore, the lagged dependent variable is found to be strongly correlated with tourist arrivals compared to all other variables.

Table 6.3. Correlation Matrix

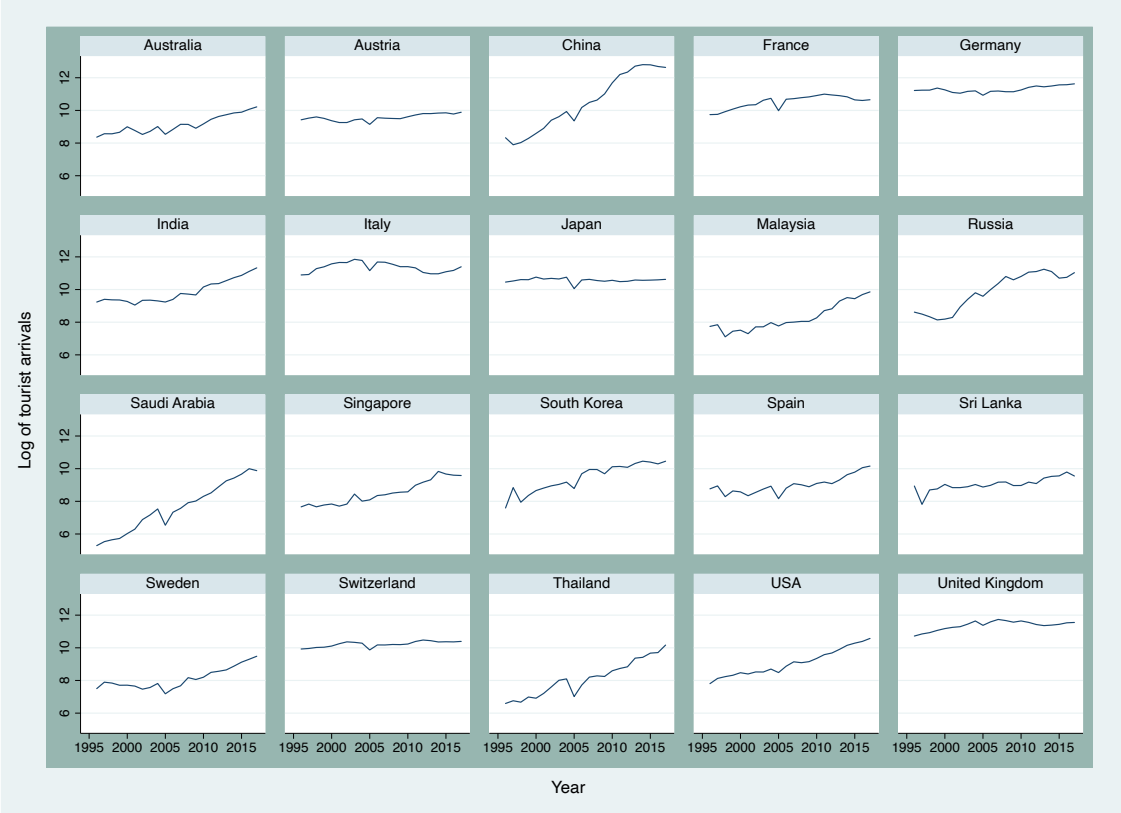
	LTA	LA_{t-1}	LT_{t-1}	LI	LP	LSP	LPO
LTA	1						
LA_{t-1}	0.9813*	1					
LT_{t-1}	0.3912*	0.3835*	1				
LR	0.1171*	0.1169*	0.1637*	1			
LP1	0.1701*	0.1756*	0.0043	0.5444*	1		
LSP	-0.1369*	-0.1476*	0.0518	-0.527*	-0.9959*	1	
LPO	0.3305*	0.3196*	0.0326	-0.5883*	-0.253*	0.2556*	1
* represent 5% statistical significance							

6.3.3 Trend of Variables

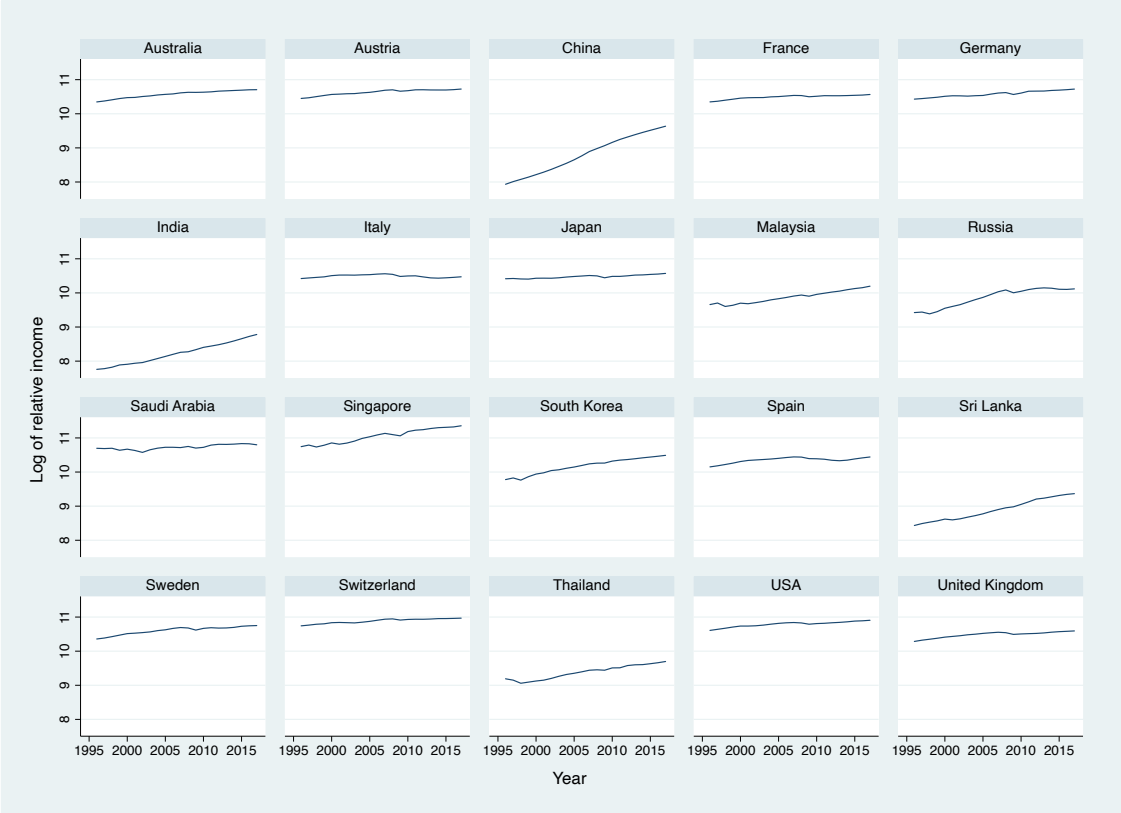
Figure 6.3 plots the yearly trend of the variables for each country. Tourist arrivals has been consistently high from the UK, Italy, and Germany. Arrivals from China has also increased continually, however, much fluctuation is seen in arrivals from Spain, South Korea, and Sri Lanka. Relative income is high in many of the developed countries in the sample, while there has been an increase in relative income for countries such China, India, and Thailand. Relative price is higher in European countries such as France, Germany, Italy, and the UK as well as the US, but lowest in South Korea and Thailand.

Figure 6.3. Trend of variables

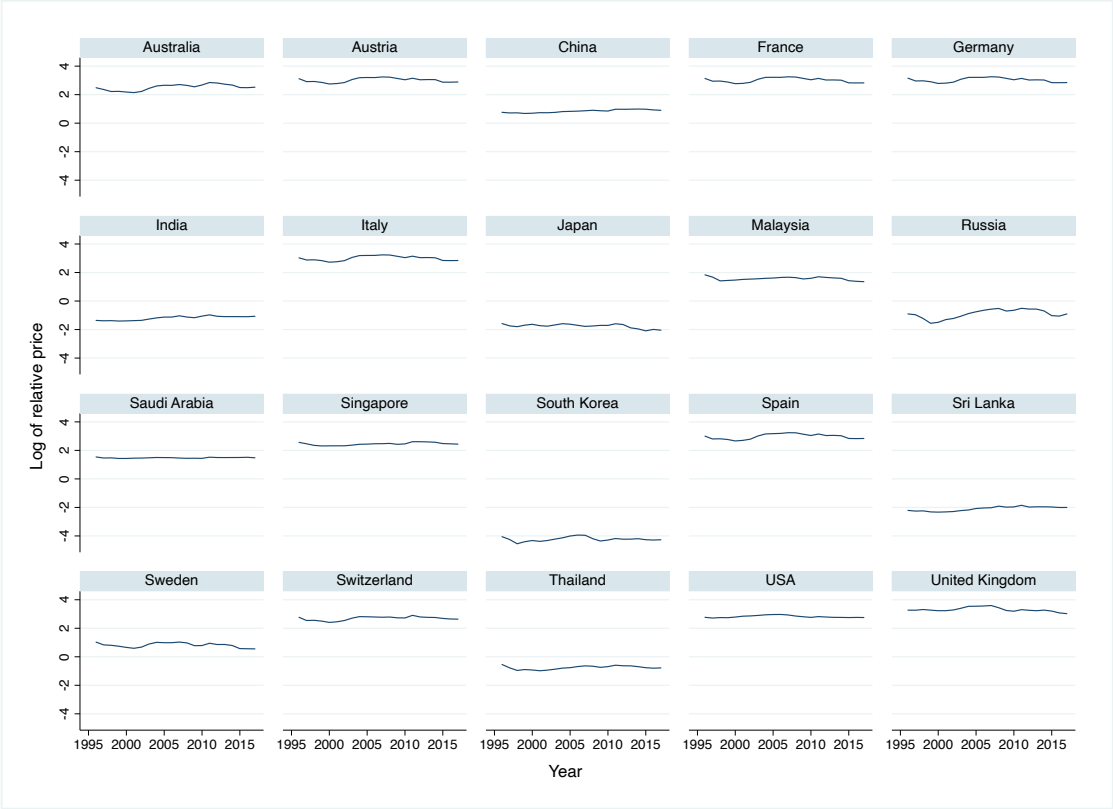
(a) Trend of Log of Arrivals (LTA)



(b) Trend of Log of Income (LI)



(c) Trend of Log of Relative Price (LP)



6.4. Models and Methods

6.4.1 Modelling tourism taxation

In assessing the impact of tourism tax, past studies have adopted both partial and general equilibrium models. Due to their computational rigour and extensive analytical capability, several authors prefer the computable general equilibrium (CGE) models. Additionally, CGE models utilize several underlying assumptions for an economy and test the economy-wide impact of tourism tax policies (Dwyer, Forsyth, and Spurr 2012, Ponjan and Thirawat 2016, Meng and Pham 2017). The effect of tourism tax amendments on the economy of Denmark (Jensen and Wanhill 2002) and Spain (Blake 2000) were among the first group of studies using CGE models. However, for analysis of the impact of tourism taxes on tourist flows, impact on welfare, pricing behaviour of tourist providers, and the impact on government revenue generation capacity, partial equilibrium models are most commonly employed. For example, Bakhat & Rosselló (2013) used the partial adjustment model to evaluate a seasonal fuel tax in a mass tourism destination,

using a case study of the Balearic Islands, while Seetaram et al. (2014) employed the autoregressive distributive lag model (ADLM) to examine the air passenger duty and outbound tourism demand from the United Kingdom. The Chi-squared automatic interaction detecting (CHAID) model (Do Valle et al., 2012), the multivariate transfer mode (Bonham & Gangnes, 1996), and the structural equations models (Kim et al., 2002) have also been applied in assessing the impact of tourism tax.

6.4.2 Tourism Demand Model

Based on the review of the existing literature, tourism tax is introduced to the model in addition to traditional determinants of tourism demand such as income, relative and substitute prices, and lagged dependent variables (Song and Gang 2008, Peng et al. 2015, Song, Qiu, et al. 2019). Additionally, qualitative variables that capture seasonality, crisis events, and financial crises are also included in the tourism demand equation. In general, the model is expressed as:

$$A_{it} = f(I_{it} + P_{it} + SP_{it} + D_t) \quad (6.1)$$

Where A_{it} denotes international tourism demand (approximated by tourist arrivals) from origin *i* to the Maldives at time *t*. I_{it}, P_{it}, SP_{it}, and D_t is the income of the origin, relative prices, substitute prices and qualitative factors in the Maldives at time *t*. The dependent variable, tourist arrivals, is explained by a set of control variables to alleviate the impact of omitted variables bias. These include income, relative price, price of substitute destination, tourism tax, population, and several dummy variables. The lagged dependent variable also referred to as 'word of mouth' effect, is used to control for the impact of prior experience at the destination (Witt and Witt 1995). Thus, equation 6.1 is further expanded as:

$$LogA_{it} = \beta_0 + \gamma LogA_{it-1} + \beta_1 LogT_{it-1} + \beta_2 LogI_{it} + \beta_3 LogP_{it} + \beta_4 LogSP_{it} + \beta_5 LogPO_{it} + \sum_{k=6}^{10} \beta_k DUMMY_t + \varepsilon_{it} \quad (6.2)$$

$$\sum_{m=6}^{10} \beta_m DUMMY_t$$

$$= \beta_6 SAR_{2003} + \beta_7 GFC_{2008} + \beta_8 AFC_{1997} + \beta_9 USA_{2001} + \beta_{10} TSUNAMI_{2004}$$

where $LogA_{it}$ is the log of the number of tourist arrivals from source i to the Maldives at time t ($\gamma > 0$), while $LogA_{it-1}$ is the lagged dependent variable; Tourism Tax $LogT_{i(t-1)}$ is the log of effective tourism tax directly (or indirectly) charged to tourists from origin country i at time t ($\beta_1 < 0$). The effective tourism tax rate is calculated by dividing the tourism tax revenue by the tourist arrivals; Income $LogI_{it}$ is the log of real GDP per capita (in US$PPP) of origin country i at time t ($\beta_2 > 0$); Relative price $LogP_{it}$ is the log of relative price adjusted by exchange rates at time t. In tourism demand studies, international tourist arrivals from different source markets to a single destination are analysed, hence the real exchange rate is used as a proxy for price. Therefore, the price is calculated as:

$$LogP_{it} = \log\left[\frac{CPI_{MD,t}}{CPI_{it}} x\ ER_{it}\right] \quad (\beta_3 < 0); \qquad (6.3)$$

where CPI_i^{MD} and CPI_t^i are the consumer price index of the Maldives and the i^{th} origin country, respectively, at time t; and EX_t^i is the exchange rate indices for the i^{th} origin country, at time t.

Substitute Price LSP_{it} is the log of substitute price at an alternative destination for a tourist from origin i at time t ($\beta_4 > 0$); Population LPO_{it} is the log of population-level in origin country i at time t ($\beta_5 > 0$); D_t represents a list of dummy variables which include the following: $SARS_{03}$, which represents the outbreak of SARS in 2003, where 1 is assigned if an observation is in the year 2003; 0 – otherwise ($\beta_6 < 0$); GFC_{08} represents the effect of 2008/2009 global financial crisis where 1 is assigned if an observation is in years 2008 and 2009; 0 – otherwise ($\beta_7 < 0$); AFC_{97} represents the 1997/1998 Asian financial crisis where 1 is assigned if an observation is in years 1997 and 1998; 0 – otherwise ($\beta_8 < 0$); USA_{01} represents the USA September 11, 2001 attacks where 1 is assigned if an observation is in the year 2001; 0 – otherwise ($\beta_9 < 0$); $TSUNAMI_{04}$ represents the December 2004 tsunami disaster in the Maldives where 1 is assigned if an observation is in years 2004 and

2005; 0 – otherwise ($\beta_{10} < 0$) and ε_{it} is the random error term, assumed to be normally distributed with a zero mean and constant variance.

6.4.3 Estimation Techniques

The study first adopts the ordinary least squares (OLS) method on pooled data and the fixed effects techniques. These techniques were adopted for comparison purposes. However, with small *T* samples, several issues can arise, including the risk of bias and the inconsistency of estimates, when applied in a dynamic panel data set up (Baltagi 2005). Other concerns include endogeneity problems, which may be due to the capturing of reverse causality or the effect of omitted variables (e.g., geographical characteristics, culture and so on), and the possibility of measurement error. This is because such errors will load into other variables. If left uncorrected, these two problems will yield OLS estimates that do not correspond to the causal effect of regressors on tourist arrivals. Thus, upward, or downward biases are possible.

Thus, to mitigate these problems, the fully modified OLS technique is adopted to estimate the international demand elasticities for the Maldives. FMOLS has the benefit of modifying the OLS estimator in other to rectify the problems of serial correlation and endogeneity (Pedroni 2001). Also, since members of the panel potentially have diverse characteristics, there is a high likelihood that they will produce different coefficient estimates. Accordingly, two FMOLS estimations are conducted: first, demand elasticities of all markets in the panel are estimated using a pooled FMOLS (i.e., pooled coefficient which assumes panel members are homogenous); and second, individual market demand elasticities (i.e., country-specific estimates which assumes panel members are heterogenous) were estimated using the group-mean FMOLS estimator (GM-FMOLS). GM-FMOLS tests the null hypotheses for each of the markets in the panel independently and provides country-specific coefficient estimates by allowing the cointegrating vector to be heterogeneous. The FMOLS group-mean estimator produces separate demand elasticities for nine-country/market origins in this study, which is crucial to the development of market-specific policies and strategies.

Before choosing these estimation methods, a pre-test to examine panel cointegration was conducted using tests by Pedroni (1999), Kao (1999) and Søren (1991). All three tests provide significant evidence of cointegration i.e., long-run relationship among the variables. Consequently, equation 6.4 gives the group-mean panel FMOLS estimator as:

$$\hat{\beta}^{*}_{GFM} = \frac{1}{N}\sum_{i=1}^{N}\hat{\beta}^{*}_{FM,i} \tag{6.4}$$

$\hat{\beta}^{*}_{FM,i}$ is given as the standard estimator of the *ith* member of the panel for the FMOLS and the related group-mean t-statistic is estimated as:

$$t_{\hat{\beta}^{*}_{GFM}} = \frac{1}{N}\sum_{i=1}^{N} t_{\hat{\beta}^{*}_{FM,i}} \tag{6.5}$$

Also, the dynamic OLS equation which includes lead and lag differences of the independent variable and controls for endogenous feedback effect is given as:

$$\begin{aligned} LogA_{it} = {} & \beta_0 + \gamma LogA_{i(t-1)} + \beta_1 LogT_{i(t-1)} + \beta_2 LogI_{it} + \beta_3 LogP_{it} \\ & + \beta_4 LogSP_{it} + \beta_5 LogPO_{it} + \sum_{m=6}^{10}\beta_m DUMMY_t \\ & + \sum_{k=-K_i}^{K_i}\delta_k \Delta LogA_{it-k} + \sum_{k=-K_i}^{K_i}\propto_k \Delta LogT_{it-k} \\ & + \sum_{k=-K_i}^{K_i}\partial_k \Delta LogI_{it-k} + \sum_{k=-K_i}^{K_i}\theta_k \Delta LogP_{it-k} \\ & + \sum_{k=-K_i}^{K_i}\varphi_k \Delta LogSP_{it-k} + \sum_{k=-K_i}^{K_i}\lambda_k \Delta LogPO_{it-k} \\ & + \sum_{k=-K_i}^{K_i}\gamma_k \Delta DUMMY_{t-k} \\ & + \varepsilon_{it} \end{aligned} \tag{6.6}$$

Where K_i and $-K_i$ are lead and lag orders, respectively. Stata 15 statistical software was used. Results from OLS, fixed effects, and FMOLS techniques are reported in table 6.4 for comparison purposes. Long-run elasticities were manually computed.

6.5. Results and Discussion

6.5.1 Tests for Stationarity and Cointegration

To avoid problems of spurious correlation, it is important to initially examine whether the series has a stationary process. Consequently, the IPS test created by Im et al. (2003) and the ADF-Fisher test created by Maddala and Wu (1999), are used to examine stationarity in this study on the level and first differenced forms of the variables. The null hypothesis in the IPS and ADF-Fisher tests is that variables have a unit root in the level I(0). Table 6.4 represents the panel unit root tests results for the variables. As indicated by the results, all factors contain unit root in the level I(0). This denotes that the use of static regression techniques like OLS will yield spurious regression problems. However, the series are stationary in their first difference I(1) which suggests that the cointegration relationship between the dependent variable and its regressors can be estimated.

Table 6.4. Results of Panel unit root tests results

Test	**IPS**		**ADF-FISHER**	
Variable	**Constant**	**Constant and Trend**	**Constant**	**Constant and Trend**
LA	3.084 (0.999)	-3.256 (0.000) [a]	5.461 (1.000)	3.475 (0.999) [a]
LT	10.315 (1.000)	3.787 (0.999) [a]	9.238 (1.000)	3.342 (0.999) [a]
LI	1.253 (0.895)	-1.424 (0.077) [a]	0.375 (0.646)	-2.950 (0.001) [a]
LP	-1.395 (0.081)	0.345 (0.635) [a]	-3.373 (0.000) [a]	1.351 (0.911) [a]
LSP	-4.704 (0.000) [a]	-3.582 (0.000) [a]	0.411 (0.659)	-4.531 (0.000) [a]
LPO	2.498 (0.993)	-0.827 (0.204) [a]	0.145 (0.557)	-2.032 (0.021) [a]
ΔLA	-18.702 (0.000) [a]	-17.041 (0.000) [a]	-2.535 (0.005) [a]	-2.013 (0.022) [a]
ΔLT	-9.094 (0.000) [a]	-7.319 (0.000) [a]	-2.028 (0.021) [a]	-3.262 (0.000) [a]
ΔLI	-10.460 (0.000) [a]	-9.803 (0.000) [a]	-3.342 (0.000) [a]	-9.756 (0.000) [a]
ΔLP	-11.602 (0.000) [a]	-9.125 (0.000) [a]	-4.049 (0.000) [a]	-6.650 (0.000) [a]
ΔLSP	-9.611 (0.000) [a]	-6.586 (0.000) [a]	-5.056 (0.000) [a]	-6.396 (0.000) [a]
ΔLPO	-3.841 (0.000) [a]	-3.930 (0.000) [a]	-3.584 (0.000) [a]	-3.888 (0.000) [a]

Notes: TA, LT, LI, LP, LSP, and LPO indicate tourist arrivals, income, price, substitute price, and population. Δ is first difference operator. The AIC was used to determine the lag lengths. a. Rejection of the null hypothesis of "unit root" at the 5% level of significance

Pedroni (2004, 1999) panel cointegration test is utilized. The output presents seven test statistics with a null hypothesis of no cointegration. Table 6.5 demonstrates the

cointegration test results. The consequences of the co-integration tests demonstrate the rejection of the null hypothesis of no cointegration relation in both the constant and trend form. This, therefore, signifies that the variables move together in a unidirectional manner and international tourism demand in the Maldives converges to its long-run equilibrium by redressing any conceivable deviation from its short-run equilibrium levels. Once the cointegration connection is determined, long-run coefficients of the regressors could be assessed by utilizing the fully modified ordinary least squares (FMOLS).

Table 6.5. Results of Panel cointegration tests

Statistic	**Constant**	**Constant and Trend**
Panel v-Statistic	-1.244 (0.893) [a]	-2.305 (0.989) [a]
Panel Rho-Statistic	2.495 (0.006)	3.187 (0.000)
Panel PP-Statistic	-1.624 (0.947) [a]	-2.476 (0.993) [a]
Panel ADF-Statistic	2.32 (0.010)	1.709 (0.043)
Group Rho-Statistic	4.11 (0.000)	4.929 (0.000)
Group PP-Statistic	-1.498 (0.932) [a]	-1.789 (0.963) [a]
Group ADF-Statistic	1.933 (0.026)	2.086 (0.018)
Notes: Dependent variable = Tourist Arrivals. v, rho, PP, ADF statistics are measured using Pedroni (2004, 1999). p values are given in parentheses. PP = Phillips-Perron; ADF = Augmented Dickey-Fuller. a. Failure to reject the null hypothesis of "no cointegration" at the 5% level of significance.		

For additional diagnostics test, the model specification test was conducted. The results show that the model is correctly specified as _hat (p-value = 0.000) is significant and _hatsq (p-value = 0.625) is not significant. This means that the squared prediction does not have much explanatory power. In addition, the Ramsey RESET test using powers of the fitted values of the Log of tourist arrivals was conducted. The results show F (3, 405) = 0.38 and Prob > F = 0.7710. This means that the model has no omitted variables.

6.5.2 The impact of tourism tax on tourism demand – All Panel

In line with the objectives of this study, results from FMOLS are presented in table 6.6, while results from pooled OLS and fixed effects regression are presented for

comparison purposes only. As expected, the coefficient of the tourism tax has a negative sign and is statistically significant (at 1%, 5% and 10% levels). This indicates that an increase in tourism tax results in a decline in the number of inbound tourism. Specifically, a 10% increase in tourism tax reduces demand by 5.4%. The degree of responsiveness of tourism demand to changes in taxes is important for tourism policy since a change in the cost of visiting a destination as a result of a change in tourism tax policies affects inbound tourism demand. Considering these empirical results, it is essential to highlight the implications of these results on the tourism industry in the Maldives. The impact of tourism tax on the tourism industry relies upon a few factors. First, as a tourism-dependent economy, a large number of the concerns of the tourism industry stakeholders appear to be that the industry is the main business that attracts the government to introduce new forms of taxes. Consequently, the impact of such tax is that it will contract industry output over most of the other businesses in the economy, not just the tourism industry. In other words, the cost base of other businesses that are substitutes for the tourism industry will also be expanded. Additionally, the degree to which the tourism tax will decrease industry output depends significantly on the pass-through effect of taxes to prices of tourism goods and services, as compared to prices of goods and services of other non-tourism industries.

Do the costs of the tourism industry items ascend thereby reducing tourist arrivals significantly by more than the level of tax imposed over the last decade in the Maldives? The nature of the increase in tourism taxes involves a significant amount of tourism revenue from Goods and Service Tax from the Tourism Sector (T-GST), the newly introduced Green Tax, Tourism Land Rent and Lease Period Extension Fee. Specifically, for the hotels (and other accommodation), the resort lease rent formula was revised in 2011 from a bed capacity-based rent to a land-based rent where US$ 8 is charged per square meter of the island. For other services that directly affect tourists, the T-GST which was introduced in 2010 at a rate of 3.5% was increased to 6% from 1st January 2012 and from 1st January 2013 it was again increased to 8%. From 1st November 2014, the rate was further increased to 12%. While tourism bed night tax was abolished from 1 December 2014, Green Tax was introduced on 1 November 2015. In 2017, 31.8% of government revenue was generated from tourism. Additionally, of the 6.3 billion, 4.2 billion was received from tourism goods and service tax (T-GST) and 1.4 billion was received from land

rent. Consequently, since accommodation and restaurant both constitute a large portion of the tourist budget, the competitiveness of the destination is eroded as tourism operators will incur higher production costs.

Tourism tax unfavourably affects key macroeconomic variables, slows down the growth of real GDP, and contracts tourism output as well as an adverse spillover effect on the global economy (Dwyer *et al.* 2012). Blanc and Winchester (2013) also reveal a slowdown of EU tourist arrivals due to an emissions trading system earmarked to curb negative environmental effects of tourism. Palmer-Tous, Riera-Font and Rosselló-Nadal (2007), found that a tax on rental cars, in a bid to make tourists bear part of the costs they create, only increases tourists' expenditures, thereby making tourism destinations less competitive rather than serving as a corrective mechanism to the environmental damage. Although the adverse impact of tourism tax on inbound tourism demand is in line previous studies, Seetaram, Song and Page (2014) found that the responsiveness of outbound tourism demand is not substantial, given that tourists are willing to pay more. In the same vein, depending on the elasticity of demand, a tourist eco-tax *not* met by improved quality of tourism products can only reduce tourists arrivals in the short-run but may stabilize in the long-run with a mix of other tourism management policies (Logar 2010). Furthermore, the role of tour operators in the discussion of the impact of tourism tax on tourism demand is important. For example, travel agents and on-line travel firms have the capacity to drive the expectations of tourists with a great understanding of specific tourism products and services tailored to the needs of their clients (Buckley and Mossaz 2016). Hence, tourism tax may affect the nature of tourism demand as well as how much supply can be available at a tourist destination over time.

6.5.3 The impact of other determinants of tourism demand

International tourist arrivals also show responses to changes in the coefficients of other variables in the tourism demand model. First, the coefficients of price measure the degree of responsiveness of inbound tourism demand to a change in price. The estimate of price variable in table 6.6 shows that inbound tourism demand is price-inelastic in the Maldives. This means that changes in price results to a less than proportionate change in inbound tourism ($\Delta LA_{it}/\Delta LP_{it} < 0$). This holds both in

the short and long run. The estimated coefficient implies that if the real exchange rate between the Maldives and the origin market appreciates by 10%, arrivals can be expected to fall by 2.1%. This, therefore, suggests that the tourism industry needs policies that limit or minimise costs incurred by tourists visiting the Maldives since it becomes relatively less attractive to consumers as the real exchange rate rises. Hence, it is important to maintain destination price competitiveness so as not to lose any market share to other competing island destinations. Secondly, income is an important determinant of inbound tourism demand. Income elasticity measures the degree of responsiveness of inbound tourism demand to changes in the real GDP per capita of a source market. Also, in interpreting income elasticity, the sign of the coefficient is of importance. A negative sign of the coefficient of income elasticity suggests that such commodity is an inferior good, meaning that as real GDP per capita rises, tourist arrivals decrease. However, since the coefficient of income elasticity is positive, inbound tourism is classified as a luxury or normal product. Consequently, a 10% rise in the real GDP per capita of a source market is expected to lead to growth in arrivals from that market by 37%. This high-income elasticity is consistent with the majority of previous studies (Lim 1999, Peng et al. 2015, Song, Qiu, et al. 2019) and also for studies with tourism-dependent countries as its case study (Croes and Vanegas 2005). Furthermore, the essential implication is that economic growth in the origin country boosts the Maldives' inbound travel market substantially.

Table 6.6. Pooled panel estimation results (Dependent variable: log tourist arrival).

Variables	Pooled OLS	Fixed effects (within) regression	Pooled Panel FMOLS
LA_{t-1}	0.943***	0.807***	-0.161***
	(0.010)	(0.029)	(0.031)
LT_{t-1}	-1.157***	-0.691	-5.396***
	(0.249)	(0.386)	(0.179)
LI	0.0314	0.462***	3.707***
	(0.026)	(0.113)	(0.120)
LP	0.464***	0.250	-0.206**
	(0.101)	(0.139)	(0.065)
LSP	0.464***	0.0366	-0.203*
	(0.100)	(0.158)	(0.086)

LPO	0.0394***	0.878***	6.399***
	(0.011)	(0.259)	(0.444)
D_{SARS}	-0.0367	-0.00159	0.0139
	(0.043)	(0.054)	(0.008)
D_{GFC}	-0.203***	-0.182***	0.101***
	(0.030)	(0.041)	(0.008)
D_{AFC}	-0.0510	-0.0861	-0.0412***
	(0.072)	(0.058)	(0.011)
D_{USA}	-0.174***	-0.137*	0.00650
	(0.044)	(0.056)	(0.009)
$D_{TSUNAMI}$	-0.385***	-0.348***	0.0369***
	(0.065)	(0.042)	(0.009)
Constant	-0.688*	-6.312***	-49.90***
	(0.336)	(1.399)	(2.180)
R^2	0.971	0.921	0.945
Adj. R^2	0.971	0.914	0.869

Source: Computed by the author from the data set.

Notes: OLS = ordinary least squares; FMOLS = fully modified OLS; LA_{t-1} = lagged log of tourist arrivals; LT_{t-1} = lagged log of tourism tax; LI = log of income variable; LP = log of price variable; LSP = log of substitute price variable; LPO = population in source market *i*; D_{SARS}; D_{GFC}; D_{AFC}; D_{USA}; and $D_{TSUNAMI}$ are dummy variables capturing the effect of the severe acute respiratory syndrome; global financial crisis; Asian financial crisis; the terrorist attacks on the World Trade Centre in the USA; and the tsunami disaster. Robust standard errors in parentheses. ***, **, * indicate 1%, 5%, and 10% significance, respectively.

Moreover, consumers make choices among alternative tourism destinations depending on their budget and which selection maximizes their satisfaction. The cross elasticity is what measures the degree of responsiveness of inbound tourism demand to the Maldives as a result of a change in the price of an alternative destination. The sign of the coefficient of cross elasticity of demand is important in the interpretation. For instance, a negative sign indicates that the two destinations are regarded as complements or as having joint inbound tourism demand. Consequently, a rise in the price of one reduces the number of arrivals to the other. However, a positive coefficient connotes that both destinations are substitutes or competitive, hence, a rise in the price of one will increase the inbound tourism demand of the other. With statistical significance as shown in table 6.6, Mauritius is considered an alternative destination by inbound tourists to the Maldives when deciding on a destination. A rise in the cost of a trip to Mauritius by 10% suggests

that the number of arrivals to the Maldives can be expected to fall by 2.9%. These results imply that in general, tourists consider Island destinations in a similar lens in terms of tourism price competitiveness.

Furthermore, since tourism demand is dynamic, earlier studies justify the use of lagged dependent variable (Etzo et al. 2014, Pham et al. 2017b). The coefficient of the lagged dependent variable represents habit persistent (also regarded as word-of-mouth effect) and is statistically significant in explaining arrivals into the Maldives. Contrary to expectation, adjustments of tourism demand to a new equilibrium in the current year after changes in any of its determinants are delayed by 16%. This signifies a reduction in tourist arrivals due to the word-of-mouth effect. However, a further look into individual market analysis reveals that the word-of-mouth effect is relatively high and positive in 9 source markets. Hence, visitors from these countries spread information about their trip to the Maldives, which leads to an increase in tourist arrivals from these countries in the succeeding period. Accordingly, destination managers in Island economies dependent on tourism can significantly boost visitor experience to a high level of satisfaction, which will subsequently generate growth in the number of arrivals from these markets.

The coefficient of the dummy variables is significant but positive for the global financial crisis and the tsunami, but negative for the Asian financial crisis variable. The positive coefficient of dummy variables suggests that different from expectation, in periods of crisis (such as SARS, GFC, US attacks, and Tsunami), consumer confidence is not affected. Rather, demand rises, but insignificantly. However, across markets, demand for tourism in the Maldives responds differently to various crisis events. Notably, the Asian and global financial crises as well as the tsunami negatively affected demand from 16 source markets, while the SARS outbreak and the September 11 attacks in the USA affected 8 and 10 markets positively and negatively respectively. Of particular interest is China, which is a country with a large demand for tourism in the Maldives. Apart from the Asian financial crisis, all crisis events negatively affect arrivals from China, especially the Tsunami. The impact of these crises is felt more in this region as an important market for the Maldives. This implies that the Maldivian tourism authority needs to diversify its market base, to offset reduced demand from one region with arrivals

from others. Additionally, an implication for stakeholders is that future strategies should reduce any overreliance on a single market or a single group of homogenous markets (Seetaram 2010, 2012).

Table 6.7. Panel FMOLS estimation results based on panel members (Dependent variable: log tourist arrival)

	Estimated coefficients									
Variables	China	Germany	UK	Italy	India	Russia	France	Japan	USA	South Korea
LA_{t-1}	0.486***	-0.299***	-0.163***	-0.0235	0.435***	0.323***	0.232***	-0.198***	0.363***	0.0679
LT_{t-1}	-8.595***	2.198***	-5.410***	-0.666*	-0.689	-3.520***	-2.212***	0.197	1.988***	0.204
LI	-2.358***	3.387***	3.704***	6.099***	1.571***	3.869***	-1.942	0.998*	1.106*	5.164***
LP	2.128***	-1.461***	-0.206*	-0.673***	-0.947***	1.645***	0.636	-1.155***	-0.441*	0.239
LSP	-3.736***	-1.676***	-0.206	-0.130	-0.798***	0.944*	0.0588	-0.924***	-0.424	0.0833
LPO	74.11***	-2.521***	6.442***	1.081	1.132	47.16***	9.171***	10.60	6.837***	-13.38*
D_{SARS}	-0.163*	0.0731***	0.0141	0.330***	-0.0424*	0.232***	0.0623	0.0618*	-0.137***	-0.104*
D_{GFC}	-0.322***	-0.0511***	0.102***	0.0802***	-0.258***	0.0674*	-0.0892**	-0.0147	-0.168***	-0.0519
D_{AFC}	-0.107	-0.0945***	-0.0408**	0.0273	0.107***	0.0559	-0.256***	-0.163***	0.0447*	-0.00174
D_{USA}	-0.236***	-0.104***	0.00685	-0.0476*	-0.260***	-0.318***	0.0892*	0.0122	-0.135***	0.0420
$D_{TSUNAMI}$	-0.574***	0.0306	0.0373**	-0.0320	-0.196***	-0.0179	-0.384***	-0.124***	-0.225***	-0.452***
Constant	-498.0***	-6.839	-50.03***	-54.58***	-13.10***	-266.8***	-10.77	-47.10	-44.41***	8.686
Obs.	20	20	20	20	20	20	20	20	20	20
R^2	0.990	0.907	0.931	0.825	0.993	0.991	0.847	0.545	0.992	0.979
Adjusted R^2	0.975	0.779	0.835	0.585	0.984	0.979	.638	-0.080	0.982	0.950

Notes: LA_{t-1} = lagged log of tourist arrivals; LT_{t-1} = lagged log of tourism tax; LI = log of income variable; LP = log of price variable; LSP = log of substitute price variable; LPO = population in source market *i*; D_{SARS}; D_{GFC}; D_{AFC}; D_{USA}; and $D_{TSUNAMI}$ are dummy variables capturing the effect of the severe acute respiratory syndrome; global financial crisis; Asian financial crisis; the terrorist attacks on the World Trade Centre in the USA; and the tsunami disaster. Robust standard errors in parentheses. ***, **, * indicate 1%, 5%, and 10% significance, respectively.

Table 6.8. Panel FMOLS estimation results based on panel members (Dependent variable: log tourist arrival).

Estimated coefficients										
Variables	Switzerland	Australia	Thailand	Spain	Austria	Saudi Arabia	Malaysia	Singapore	Sri Lanka	Sweden
LA_{t-1}	0.554***	-0.0889	0.569***	0.259***	0.122	-0.545***	-0.285***	0.116**	-0.232*	-0.434***
LT_{t-1}	-1.223	5.212***	-0.539	6.600***	2.144***	4.691***	8.822***	6.047***	6.849***	0.953*
LI	-4.009***	4.847**	5.591***	3.514***	0.733	-4.711***	1.253**	0.378	-1.557***	-0.880
LP	1.027**	-1.620***	-0.393	-1.310**	-0.194	4.936***	-0.688***	1.212***	0.496**	-2.331***
LSP	1.040*	-1.883***	0.834	-1.704***	-0.874**	-1.182***	-0.575**	-0.0429	0.0455	-2.898***
LPO	2.630*	0.441	-20.55***	1.212	2.788*	13.90***	3.430***	0.842**	6.953***	30.97***
D_{SARS}	-0.183*	-0.0191	0.168*	0.0348	-0.0163	0.573***	0.136***	0.519***	-0.0445	0.00643
D_{GFC}	-0.0844	-0.163***	-0.193***	-0.248***	-0.149***	0.247***	-0.260***	-0.0230	-0.0128	0.195***
D_{AFC}	-0.0893	-0.0665	-0.377***	-0.371***	0.0792	-0.0298	-0.0506	-0.146***	-0.435***	-0.0780
D_{USA}	0.0648	0.163**	0.0246	-0.317***	-0.0710*	-0.0550	-0.184***	-0.139***	-0.0149	0.195***
$D_{TSUNAMI}$	-0.474***	-0.0920*	-0.679***	-0.373***	-0.254***	0.293**	0.0802**	-0.151***	-0.0664**	0.0630
Constant	40.53***	-39.73**	34.23	-32.72***	-5.565	10.16**	-13.86***	-2.617	3.170	-40.84***
Observations	20	20	20	20	20	20	20	20	20	20
R^2	0.920	0.946	0.963	0.910	0.882	0.985	0.986	0.984	0.904	0.972
Adjusted R^2	0.809	0.871	0.912	0.786	0.719	0.965	0.967	0.962	0.772	0.934

Notes: LA_{t-1} = lagged log of tourist arrivals; LT_{t-1} = lagged log of tourism tax; LI = log of income variable; LP = log of price variable; LSP = log of substitute price variable; LPO = population in source market *i*; D_{SARS}; D_{GFC}; D_{AFC}; D_{USA}; and $D_{TSUNAMI}$ are dummy variables capturing the effect of the severe acute respiratory syndrome; global financial crisis; Asian financial crisis; the terrorist attacks on the World Trade Centre in the USA; and the tsunami disaster. Robust standard errors in parentheses. ***, **, * indicate 1%, 5%, and 10% significance, respectively.

6.5.4 Individual Market Analysis – GM-FMOLS

The impact of the determinants of inbound tourism to the Maldives were distinct from one source market to another. For the top 10 markets presented in table 6.7, the coefficient of the lagged dependent variable has the expected sign for 5 markets. This suggests that the word-of-mouth effect is significant. Thus, tourists from China, India, Russia, France, and the US tend to repeat their visit to the Maldives. However, this variable does not effectively explain arrivals from the Italy and South Korea. Tourism tax coefficients are significant for China, Germany, the UK, Italy, Russia, France, and the US, while the tourism tax coefficient is not significant for India, Japan, and South Korea in this category. In markets where tourism tax is significant, a 1% increase in tourism tax leads to an 8.6% decrease in China; 5.4% decrease for the UK; 3.5% for Russia and a little higher than 2% decrease in arrivals from France, except for arrivals from Germany and the US with 2% increase in arrivals for a 1% increase in tourism tax. The income variable is significant for all countries in this category, except for France, and coefficient are above unity. Also, price is significant for all countries except for France and South Korea. Substitute price is not significant for arrivals from the UK, Italy, France, the US, and South Korea. In terms of population size, a percentage increase in population variable for countries with a larger population (e.g., China and Russia) significantly enhances arrivals.

The impact of the determinants of inbound tourism was also distinct from one source market to another among the markets positioned 11 to 20. As shown in table 8, the coefficient of the lagged dependent variable has the expected sign and is positive for only four markets. This denotes that only tourists from Switzerland, Thailand, Spain, and Singapore tend to repeat their visit to the Maldives. Nonetheless, the lagged dependent variable does not explain arrivals from Austria. Furthermore, the tourism tax coefficient is significant at the 1% level for all countries in this category apart from Thailand. However, except for Switzerland, the coefficient of tourism tax is positive for all these countries. This is a notable distinction from the tourism tax coefficient of countries in the top 10 markets. A 10% rise in tourism tax is expected to lead to a surge in arrivals, up to a high of 6.3% and a low of 1%. This suggests that tourism demand is insensitive to tax

changes as tourism tax may account for only a small proportion of the overall trip cost (Seetaram et al. 2014), as well as motivation to travel to an island destination such as the Maldives. Apart from Austria and Sweden, the income variable is significant for all countries in this category and coefficient are above unity the in a majority of the countries.

Tables 6.7 and 6.8 report tourism demand elasticities for the source markets separately using the FMOLS group-mean estimator. This estimator provides for the estimation of long-run relationships for each member of the panel. Table 6.7 reports estimates of the top 10 source markets, while table 6.8 reports the source markets from positions 11 to 20. As shown in the bottom section of both tables, the data fits the model very well in all cases, since both R^2 and adjusted R^2 are relatively high. The only exception is Japan, with a negative adjusted R^2, but this can be improved by increasing the sample size.

6.5.5 Sensitivity Analysis: Price, Tourism Tax and Price Competitiveness Index

To check the robustness of the results, this study modifies the baseline model in equation (2) to estimate five additional regression models. In columns 1 and 2, the tourism tax variable is excluded from the baseline model, and the own price variable is also excluded in columns 3 and 4. Columns 5 and 6 present estimations of the model with both tax and price variables but use different measures of own and substitute price. As noted by Seetaram et al. (2014), the inclusion of both price and tax variables may affect the magnitude of estimated coefficients on each other because tourism tax is also regarded as one aspect of own price or cost of tourism products and services. Additionally, this study estimates tourism demand models with the standard tourism price variable measured by CPI and exchange rate, and the price competitiveness index (PCI) measured by relative price level (calculated using the ratios of unadjusted and adjusted GDP per capita PPP) as introduced by Seetaram et al. (2016). According to the study, the price competitiveness index outperforms real exchange rate measures when determining the price effect in tourism demand models, and can effectively monitor changes over time, although this is the first study to present the use of this index in the context of an inbound tourism demand case. In summary, this study attempts to mitigate the problem of

multicollinearity. Results of this sensitivity analysis are presented in table 6.9, which also includes the main results from table 6.6 for comparison.

From the estimation results in table 6.9, without the tax variable in the model, the price competitiveness index surpasses the standard tourism price variable in terms of income elasticity and price effect. It also has the expected sign for cross elasticity. Furthermore, apart from the tourism goods and sales tax (T-GST), tourism taxes in the Maldives are charged separately from own price e.g., departure tax, airport maintenance charge, and bed taxes. Results in columns 3 and 4 indicate that PCI has the correct sign for substitute price and tax variables, and income elasticity is higher than the standard own price variable. The tourism tax coefficient is negative and higher but is not significantly different from the coefficient from the other estimations. Generally, the use of PCI is worth considering when modelling tourism demand. Also, both income elasticity and the decrease in the volume of repeat visits are higher when modelling tourism demand using PCI. Overall, the results for the impact of past tourist arrivals, per capita income, and adjusted relative prices are robust to the inclusion of additional and alternative variables.

Table 6.9. FMOLS estimation results (Dependent variable: log tourist arrival).

	Estimated coefficients					
Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Price, no tax	PCI, no tax	Substitute Price with tax	Substitute PCI with tax	Price and all variables	PCI and all variables
LA_{t-1}	0.432***	0.272***	-0.316***	-0.200***	-0.417***	-0.161***
	(0.037)	(0.034)	(0.026)	(0.038)	(0.030)	(0.031)
LI	1.981***	2.635***	4.356***	3.472***	4.591***	3.707***
	(0.160)	(0.171)	(0.115)	(0.126)	(0.124)	(0.120)
LPO	-3.994***	-6.419***	5.881***	5.707***	3.269***	6.399***
	(0.423)	(0.440)	(0.249)	(0.516)	(0.404)	(0.444)
D_{SARS}	0.000764	-0.00643	0.0117	0.0105	0.00199	0.0139
	(0.013)	(0.011)	(0.007)	(0.011)	(0.007)	(0.008)
D_{GFC}	-0.00613	-0.0324**	0.104***	0.104***	0.0867***	0.101***
	(0.011)	(0.010)	(0.007)	(0.011)	(0.007)	(0.008)
D_{AFC}	-0.0145	-0.0360**	-0.0136	-0.0365*	-0.0103	-0.0412***
	(0.017)	(0.014)	(0.008)	(0.015)	(0.009)	(0.011)
D_{USA}	-0.0526***	-0.164***	-0.0175*	0.00292	-0.0887***	0.00650
	(0.013)	(0.017)	(0.007)	(0.012)	(0.011)	(0.009)

$D_{TSUNAMI}$	-0.0908***	-0.0483**	0.111***	0.0402***	0.138***	0.0369***
	(0.011)	(0.015)	(0.010)	(0.011)	(0.011)	(0.009)
LP	0.356***					-0.206**
	(0.095)					(0.065)
LSP	0.518***			0.0474		-0.203*
	(0.125)			(0.044)		(0.086)
LPCI		0.574***			0.302***	
		(0.054)			(0.036)	
LSPCI		-0.262***	-0.386***		-0.561***	
		(0.069)	(0.038)		(0.045)	
LT_{t-1}			-5.795***	-5.232***	-5.468***	-5.396***
			(0.150)	(0.229)	(0.163)	(0.179)
Constant	1.304	7.422***	-53.49***	-44.73***	-44.00***	-49.90***
	(2.064)	(1.487)	(1.343)	(1.917)	(1.809)	(2.180)
R^2	0.865	0.884	0.935	0.931	0.936	0.945
Adj. R^2	0.715	0.755	0.863	0.855	0.849	0.869

Notes: LA_{t-1} = lagged log of tourist arrivals; LT_{t-1} = lagged log of tourism tax; LI = log of income variable; LP = log of price variable; LSP = log of substitute price variable; LPO = population in source market *i*; LPCI = log of relative price competitiveness index; LSPCI = log of substitute price competitiveness index; D_{SARS}; D_{GFC}; D_{AFC}; D_{USA}; and $D_{TSUNAMI}$ are dummy variables capturing the effect of the severe acute respiratory syndrome; global financial crisis; Asian financial crisis; the terrorist attacks on the World Trade Centre in the USA; and the tsunami disaster. Robust standard errors in parentheses. ***, **, * indicate 1%, 5%, and 10% significance, respectively.

6.6. Conclusion and Policy Implications

The focus of this study i to evaluate the impacts of imposing taxes on tourism and the implications for inbound tourism. The findings show that amending tax policies by increasing existing rates or introducing new ones had negative influences on five tourist source markets (China, the UK, Italy, Russia, and France), which accounts for up to 44% of the total international tourist arrivals to the Maldives. This implies that, for destinations dependent on tourism, tax policy has a direct effect on the volume of international tourist arrivals. Also, inbound tourism in the Maldives is inelastic ($\boldsymbol{\varepsilon^D < 1}$) for changes in the tourism tax. However, the magnitude and sensitivity to the level of tourism tax elasticity vary across source markets. Inbound tourists from 10 source markets, which accounts for 22% of the total arrivals, seem prepared to pay more for the most part and disregard the broader impact of tourism tax.

In line with previous studies (Seetaram et al. 2014, 2016, Dogru et al. 2017b), after population, income is the largest driver of inbound tourism. As expected, income elasticity of demand is positive and greater than or equal to unity in 12 source markets. Thus, for these markets, the estimates of income elasticities suggest that travel and tourism are luxuries, and this strengthens the justification that it could be taxed. In contrast, China, Switzerland, Saudi Arabia, Sri Lanka all have negative income elasticities. In other words, as income rises in these tourist source markets, there is a decrease in the demand for tourism in the Maldives. This finding is in line with previous studies which demonstrate the possibility of a negative income elasticity of demand (Ketenci 2010, Fredman and Wikström 2018). However, a negative income elasticity may be due to the sample size for each country, nearness to the destination which makes Maldives a luxury to farther source markets, and the potentials for visiting other competing and cheaper destination with similar features as the Maldives. As an important determinant of tourism demand, own price variable is significant in all destinations except for France and South Korea; it is negative ($\beta_3 < 0$) for 10 destinations, but positive for 6 destinations. This suggests that inbound tourism from tourist source markets was negatively influenced by the relative price of travel and accommodation in the Maldives.

The findings also suggest that the use of tourism tax revenue to remedy budget deficit and grow the economy has implications for tourism policy in an Island economy dependent on tourism with regards to managing the volume of inbound tourism despite high taxes and budget deficit issues.

This study has important policy implications. Increase in tourism tax not matched by a significant increase in government tourism expenditure is contractionary and consequently harms the tourism industry by decelerating international tourist arrivals. Thus, policies that can integrate the benefits of tourism tax revenue by enhancing the destination image and competitiveness are highly desirable.

There is still a lack of strong evidence about the degree of price sensitivity of demand for inbound tourism to the Maldives, and how tourists will respond to specific tourism taxes. Hence, further empirical evidence on how tourists respond to governments' fiscal policies is necessary. One way of achieving this may be to conduct a sectoral analysis of each tourism tax type and the performance of the sector in terms of tourist expenditure.

Chapter 7. Conclusion

7.1 Introduction

The global development of the tourism industry brought into sharp focus on several tourism products and services on which the increase of existing tourism taxes as well as the introduction of new ones is based. Consequently, taxing tourism has grown to be one of the ways by which tourism destinations reap the economic gains from the growth of the industry. However, the tourism industry risks being overtaxed, leading to underinvestment in the industry. In comparison to other sectors, the tourism industry is widely believed to be unfairly singled out for taxation to the detriment of both international and domestic tourists (Dwyer et al. 2013). Although the argument for an overtaxed tourism industry seems appealing, the study by Blake (2000), quantified the effects of tourism taxation in Spain and found that there is a marginal impact of taxation across the whole Spanish economy. This suggests that the tourism industry is rather under-taxed relative to other sectors, arguably because of large subsidies given to these sectors, for example, the transportation sector which is highly interlinked with the tourism industry. Also, while some studies examine the need for tourism taxes, either to correct for negative externalities such as pollution or as simply an export tax, others argue against such taxes as it affects competitiveness.

Another group of studies have assessed the impact of tourism taxes on tourism business and the government, however, there is a paucity of study on its impact on both domestic and international tourists. Seetaram et al. (2014) claimed that tourism tax reduces outbound tourism but note that this reduction is not strong. Forsyth et al. (2014) also noted the importance of tourism demand elasticities in determining the demand impact of tourism taxes.

Thus, based on the ongoing debate, it has become increasingly important to assess the impact of tourism taxation on domestic and international tourism. This study proposes to address these two questions using two distinct case studies.

Firstly, tourism tax impacts for 25 member states in the European union are assessed in terms of domestic tourism and secondly, tourism tax impacts are assessed in the Maldives for international tourism. While the former is

characterized by a high volume of domestic tourism, the latter depends heavily on tourism and is a representative for small island states dependent on tourism. It is believed that this is the first time such research has been carried out and it is, therefore, an important contribution to the debate on the impact of tourism taxon tourist behaviour.

7.2 Key contribution to the literature

The key contributions to the literature are as follows:

i. This study is a novel attempt to provide a comprehensive analysis of the effect of taxation on domestic tourism. Theoretically it integrates tourism tax into consumer behaviour and choice frameworks in order to understand what factors influence household choice of tourism products and destinations.
ii. It also demonstrates the adverse impact of tourism taxes, for which there has been little empirical evidence for households with specific socio-demographic features.

The research concludes that at the household level, the impact of tourism tax on tourism expenditure in the EU is positive. However, when specific household demographic characteristics are considered, tourism tax has adverse consequences on tourism expenditure for households with children, households with female heads, and households above the median income.

Additionally, the impact of tourism tax on tourism demand in small island destinations such as the Maldives is negative. However, there are notable differences across the top source markets. Specifically, arrivals from Germany, USA, Australia, Spain, Austria, Saudi Arabia, Malaysia, Singapore, Sri Lanka, and Sweden, which makes up half of the top markets do not reduce arrivals despite tourism tax. This identifies both important policy implications and a rich vein of further research that can be undertaken.

The holistic and inclusive nature of the research is a contribution to knowledge but there are limitations in that the household level analysis of domestic tourism is dependent on the survey and only data on value-added tax on tourism services are captured. It does, however, highlight the differences in tourist behaviour towards

tourism taxes across household types. A conclusion that resonates with the current debates against tourism taxes.

7.2.1 The impact of tourism taxation and the moderating role of children, gender, and income class

The absolute effect of tourism taxation on domestic tourism is positive, but its moderating effect when children, gender and income class are considered is negative, which suggests that tourism tax for a household with these sociodemographic features should decrease tourism expenditure. Essentially, the number of children in the family, the gender and marital status of the household head, as well as the income class of the household would be expected to moderate how tourism tax affect household spending on domestic tourism in the EU. The influence of tourism tax was measured by evaluating its effect on participation in domestic tourism as well as spending on domestic tourism, with the former examining the effect of average reduced value-added tax (VAT) on tourism services and the latter any evidence of a reduction in tourism spending as a result of actual tourism tax paid. The motivation for assessing how the impact of tourism tax differs across household types is in line with the tourism expenditure literature which indicated diversity among various household types, some finding family life cycle emerging as a major driver for household participation and spending on tourism services.

The expenditure model revealed that, in the EU, the impact of tourism taxes is negative for households with children, households with female head and households with income above the national median. However, single household heads do not decrease spending as a result of tourism tax, even when they spend less in general on domestic tourism services when compared to married household heads, a result which gives domestic tourism an advantage when tourism tax variable is moderated by gender. This would suggest that marketing of domestic tourism service can be conveniently directed towards this category of households, and the creation of a tourism service base capable of supporting households with female head and households with income above the national median who spend less due to tourism tax. The relative coefficient values of these household types

confirmed the supremacy of their moderating roles as one of the most important influences on domestic tourism expenditure.

7.2.2 Tourism taxation and consumer behaviour in EU macro-regions

The disaggregated results across EU macro-regions indicated that the impact of tourism taxation on domestic tourism spending is different for each location. In line with results from the whole sample, the absolute impact of tourism tax is positive; however, results of the moderating effect of socio-demographic features differ from the results of the whole EU sample. The presence of children leads to a negative impact of tourism tax on domestic tourism spending in all regions except for Germany and France.

Furthermore, in these two regions, tourism spending is not affected directly by the presence of children, but its moderating impact is significantly reduced. Income class had a greater negative impact than other socio-demographic features, which reflects the possibility of substitution of domestic tourism for international tourism in the EU macro-regions by richer households. The inclusion of these additional moderating variables enhanced that substitutability, confirming the adverse influence of income class and children on domestic tourism spending as a result of tourism taxes.

7.2.3 The role of Household characteristics

The common approach to the micro-level analysis of tourism expenditure is to include household economic, sociodemographic, trip-related, as well as psychographic variables in the model. Hence, in addition to tourism tax variables, the Heckman model also assessed the determinants of domestic tourism participation and spending by controlling for these variables. Household income elasticity shows that a significant increase in income would decrease domestic tourism expenditure by only a small amount for the entire sample of EU households, with higher-income households being less sensitive to income changes. Age, education, gender, and employment status of household head, as well as the size of the family and the population density of where they live, are all to assume that they represent alternative dimensions of the same characteristic.

However, there are significant differences in how they influence participation and spending on domestic tourism. Large households with older household heads that

are single, employed and have higher education are less likely to participate and spend less on domestic tourism, either due to their knowledge, experience, and size of the family or because they can take advantage of a cheaper holiday abroad. On the other hand, female household heads with children, who live in densely or intermediately populated regions are more likely to participate and spend more on domestic tourism in the EU. Smaller households with younger household heads that are married or in a civil partnership and have lower education are more likely to participate and spend more on domestic tourism. This is because such household structures are supposedly more frugal in terms of going on and/or spending on international holidays due to the ease of travelling domestically.

7.2.4 Taxation and Small Island Developing States: the negative impact of tourism taxation

In line with previous studies which recommends a reduction in tourism tax for small island economies that depends on tourism (Aguilo et al 2005; Do Valle et al. 2012), the Maldives demonstrated high rates of tourism taxes which decreased international tourist arrivals from its main markets. This may lead to a potential shift of international arrivals to other competing destinations. Hence, the Maldives may have benefitted from an immediate reduction in tourism tax and taken advantage of its location and other strategic tourism destination features, which also connects significantly with tourism services that would bring more revenue from higher levels of export enhancing jobs to the country.

The impact of lagged dependent variable on tourist arrivals to the Maldives is negative. In order words, repeat visits to the Maldives are negatively affected. This suggests that past visitors do not recommend a visit to the Maldives which holds severe implications for destination image and competitiveness. Additionally, both own and substitute prices, as well as the Asian financial crisis, affect tourism arrivals negatively. The creation of an effective tourism strategy is only an addition to reducing high levels of tourism taxes on several aspects of the tourism industry, which ranges from goods and sales taxes to hotels and resorts.

Hence, strategy both nationally and within specific tourism firms should compare superiorly to those of competing destinations. Within the governments capacity, results suggest that including tourism tax in the demand model accounts for failure

to provide a platform for innovative tourism firms, with the skill and technology required to grow the tourism industry in place of higher tourism taxes supposedly geared towards increased government revenue from a booming sector.

7.3 Policy Recommendations

A high tourism tax has implication on domestic tourism planning decisions across the European Union (EU) as well as tourism marketers and fiscal policymakers at large. Therefore, in a microeconomic model of tourism tax, considering only the direct impact of tourism tax may be misleading as several household composition and sociodemographic features matters.

Thus, for domestic tourism marketing strategies in the EU, stakeholders need to consider unique strategies for different groups and family life cycle which can be addressed separately; one policy for households with children who live above median income and is headed by a female on one hand, and single households on the other. The information from this research is also useful for government investment in tourism services as well as support for tourism businesses.

Furthermore, a higher tourism tax constrains tourists to pay for the expanded costs by diminishing the share of total household budget allocated to domestic tourism in a subsequent holiday. One deduction of this also is that the additional expense of a tourism tax has an altogether negative effect on the spending share for essential consumptions of tourism services (such as renting hotel accommodation; transport; admission to cultural services; admission to amusement parks; restaurant and catering services; admission to sporting events, etc).

For post-COVID recovery strategies, the information from this study can be used to create policies and evaluate existing strategies, especially for tourism marketers. Specifically, marketing strategies can be addressed equally to all household types regardless of location especially those with children who live in sparsely populated regions to enhance participation in domestic tourism. Also, tourism policies in different EU macro-regions would differ significantly from one another as a result of the different results in the determinants of tourism participation and spending in the macro-regions is also important for tourism policy in the EU.

Consequently, since the impact of tourism tax might be weakened if household sociodemographic features are considered, households generally become mindful of tourism taxes.

Also, in the post-COVID era, the use of tax revenue to remedy budget deficit and grow the economy should be largely discouraged. This particularly has gross negative consequences for tourism policy in an Island economy dependent on tourism with regards to managing the volume of inbound tourism despite high taxes and budget deficit issues. An increase in tourism tax not matched by a significant increase in government tourism expenditure is contractionary and consequently harms the tourism industry by decelerating international tourist arrivals. Thus, policies that can integrate the benefits of tourism tax revenue by enhancing the destination image and competitiveness are highly desirable.

7.4 Limitations and Directions for Future Research

Although the 2015 Household Budget Survey (HBS) is yet to be released, such data alongside the 2010 and 2005 surveys can be used to construct a panel data which can provide more information. However, since there is currently no availability of such data, the current study was unable to measure the dynamics of tourism tax changes and the effect of conditional variables over time. Thus, the current study presents two snapshots for the EU and across EU-Macro regions using data from the 2010 HBS. The results are based on Heckman model; causality issues may thus arise from unobservable variables that have not been identified. For example, how much of tourism tax changes are passed on to prices and how this informs the decision to participate and spend on domestic tourism services.

Future research in this area may assess accommodation choice and spending decisions by domestic and/or international tourists in Italy where tourism tax is considered before deciding where to stay and how much to pay. Also, it may seem like people look more at the idea of the price (how much it costs rather than the tax rate). This is because it can only be part of the decision-making process if it is included/transmitted to the final price. The analysis might be improved if tourism tax paid and tourism expenditure in one survey is compared with another.

For the case of Maldives, data available are unable to demonstrate how inbound tourists are influenced by fiscal policy at the destination. Particularly, more detailed

data on specific tourism taxes can aid a sectoral analysis of the performance of each tourism sub-sector in the presence of tourism tax.

References

A. B. Atkinson, J. G. and N. H. S., 1990. Spending on Alcohol: Evidence From the Family Expenditure 1970-1983. *The Economic Journal*, 100 (402), 808–827.

Abeyratne, R. I. R., 1993. Air transport tax and its consequences on tourisms. *Annals of Tourism Research*, 20 (3), 450–460.

Afonso, W., 2016. The Equity of Local Sales Tax Distributions in Urban, Suburban, Rural, and Tourism Rich Counties in North Carolina. *Public Finance Review*, 44 (6), 691–721.

Aguiló, E., Alegre, J., and Sard, M., 2005. The persistence of the sun and sand tourism model. *Tourism Management*, 26 (2), 219–231.

Aguiló, E., Palmer, T., and Rosselló, J., 2012. Road transport for tourism: Evaluating policy measures from consumer profiles. *Tourism Economics*, 18 (2), 281–293.

Aguiló, E., Riera, A., and Rosselló, J., 2005. The short-term price effect of a tourist tax through a dynamic demand model. The case of the Balearic Islands. *Tourism Management*, 26 (3), 359–365.

Aguiló Perez, E. and Juaneda, S. C., 2000. Tourist expenditure for mass tourism markets. *Annals of Tourism Research*, 27 (3), 624–637.

Alam, M. S. and Paramati, S. R., 2017. The dynamic role of tourism investment on tourism development and CO2emissions. *Annals of Tourism Research* [online], 66, 213–215. Available from: http://dx.doi.org/10.1016/j.annals.2017.07.013.

Alegre, J., Mateo, S., and Pou, L., 2009. Participation in tourism consumption and the intensity of participation: An analysis of their socio-demographic and economic determinants. *Tourism Economics*, 15 (3), 531–546.

Alegre, J., Mateo, S., and Pou, L., 2013. Tourism participation and expenditure by Spanish households: The effects of the economic crisis and unemployment. *Tourism Management* [online], 39, 37–49. Available from: http://dx.doi.org/10.1016/j.tourman.2013.04.002.

Alegre, J. and Pou, L., 2004. Micro-economic determinants of the probability of

tourism consumption. *Tourism Economics*, 10 (2), 125–144.

Alegre, J. and Pou, L., 2014. Research note: Seasonal preferences and survey design - Tourism expenditure models with household budget surveys revisited. *Tourism Economics*, 20 (4), 893–900.

Alén, E., Nicolau, J. L., Losada, N., and Domínguez, T., 2014. Determinant factors of senior tourists' length of stay. *Annals of Tourism Research*, 49, 19–32.

Alsumairi, M. and Hong Tsui, K. W., 2017. A case study: The impact of low-cost carriers on inbound tourism of Saudi Arabia. *Journal of Air Transport Management* [online], 62, 129–145. Available from: http://dx.doi.org/10.1016/j.jairtraman.2017.04.001.

Álvarez-Albelo, C. D., Hernández-Martín, R., and Padrón-Fumero, N., 2017. Air passenger duties as strategic tourism taxation. *Tourism Management*, 60, 442–453.

Álvarez-Díaz, M., González-Gómez, M., and Otero-Giráldez, M. S., 2019. Low cost airlines and international tourism demand. The case of Porto's airport in the northwest of the Iberian Peninsula. *Journal of Air Transport Management*, 79 (June), 101689.

Amemiya, T., 1984. Tobit models: a survey. *Journal of Econometrics*.

Antonakakis, N., Dragouni, M., and Filis, G., 2015. How strong is the linkage between tourism and economic growth in Europe? *Economic Modelling* [online], 44, 142–155. Available from: http://dx.doi.org/10.1016/j.econmod.2014.10.018.

Arguea, N. M. and Hawkins, R. R., 2015. The rate elasticity of Florida tourist development (aka bed) taxes. *Applied Economics*, 47 (18), 1823–1832.

Asian Development Bank, 2011. *The Maldives: Country Assistance Program Evaluation*.

Bai, J. and Perron, P., 1998. Estimating and Testing Linear Models with Multiple Structural Breaks. *Econometrica*, 66 (1), 47–78.

Bakhat, M. and Rosselló, J., 2013. Evaluating a seasonal fuel tax in a mass tourism destination: A case study for the Balearic Islands. *Energy Economics*

[online], 38, 12–18. Available from: http://dx.doi.org/10.1016/j.eneco.2013.02.009.

Baltagi, B. H., 2005. *Econometric Analysis of Panel Data*. Third. England: John Wiley & Sons, Ltd.

Bankole, A. S. and Babatunde, A. M., 2010. Elasticities of Demand for Tourism in Nigeria: An Ardl Approach. *Tourism Analysis* [online], 15 (4), 489–496. Available from: http://www.ingentaconnect.com/content/cog/ta/2010/00000015/00000004/art00009%5Cnhttp://dx.doi.org/10.3727/108354210X12864727453421.

Barquet, A., Brida, J. G., Osti, L., and Schubert, S., 2011. An analysis of tourists' expenditure on winter sports events through the Tobit censorate model. *Tourism Economics*, 17 (6), 1197–1217.

Bel, F., Lacroix, A., Lyser, S., Rambonilaza, T., and Turpin, N., 2014. Domestic demand for tourism in rural areas: Insights from summer stays in three French regions. *Tourism Management* [online], 46, 562–570. Available from: http://dx.doi.org/10.1016/j.tourman.2014.07.020.

Beladi, H., Chao, C. C., Hazari, B. R., and Laffargue, J. P., 2009. Tourism and the environment. *Resource and Energy Economics*, 31 (1), 39–49.

Belenkiy, M. and Riker, D., 2013. Modeling the International Tourism Expenditures of Individual Travelers. *Journal of Travel Research*, 52 (2), 202–211.

Benar, H. and Jenkins, G. P., 2008. The economics of regulation and taxation policies for casino tourism. *Tourism Economics*, 14 (3), 483–510.

Bernini, C. and Cracolici, M. F., 2015. Demographic change, tourism expenditure and life cycle behaviour. *Tourism Management* [online], 47, 191–205. Available from: http://dx.doi.org/10.1016/j.tourman.2014.09.016.

Biagi, B., Brandano, M. G., and Pulina, M., 2017. Tourism taxation: A synthetic control method for policy evaluation. *International Journal of Tourism Research*, 19 (5), 505–514.

Bikas, E. and Saikevicius, D., 2010. The reform of value–added tax in Lithuania: productivity and collection efficiency. *In*: *6th International Scientific*

Conference May 13–14, 2010, Vilnius, Lithuania. Business and Management.

Bilgic, A., Florkowski, W. J., Yen, S. T., and Akbay, C., 2013. Tobacco spending patterns and their health-related implications in Turkey. *Journal of Policy Modeling* [online], 35 (1), 1–15. Available from: http://dx.doi.org/10.1016/j.jpolmod.2012.09.004.

Bird, R. M., 1992. Taxing tourism in developing countries. *World Development*, 20 (8), 1145–1158.

Blake, A., 2000. The economic effects of tourism in Spain. *Christel DeHaan Tourism and Travel Research Institute Discussion Papers*, 32.

Blanc, É. and Winchester, N., 2012. The Impact of the EU Emissions Trading System on Air Passenger Arrivals in the Caribbean. *Journal of Travel Research*, 52 (3), 353–363.

Bonham, C., Fujii, E., Im, E., and Mak, J., 1992. The impact of the hotel room tax : An uninterrupted time series approach. *National Tax Journal*, 45 (4), 433–441.

Bonham, C., Gangnes, B., and Zhou, T., 2009. Modeling tourism: A fully identified VECM approach. *International Journal of Forecasting* [online], 25 (3), 531–549. Available from: http://dx.doi.org/10.1016/j.ijforecast.2008.11.014.

Bonham, C. S. and Gangnes, B., 1996. Intervention analysis with cointegrated time series: the case of the Hawaii hotel room tax. *Applied Economics* [online], 28 (10), 1281–1293. Available from: http://10.0.4.56/000368496327831%5Cnhttp://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=9702213231&site=ehost-live.

Boonekamp, T., Zuidberg, J., and Burghouwt, G., 2018. Determinants of air travel demand: The role of low-cost carriers, ethnic links and aviation-dependent employment. *Transportation Research Part A: Policy and Practice* [online], 112 (February), 18–28. Available from: https://doi.org/10.1016/j.tra.2018.01.004.

Brida, J. G., Disegna, M., and Osti, L., 2013a. Visitors' expenditure behaviour at

cultural events: The case of Christmas markets. *Tourism Economics*, 19 (5), 1173–1196.

Brida, J. G., Disegna, M., and Osti, L., 2013b. The effect of authenticity on visitors' expenditure at cultural events. *Current Issues in Tourism*, 16 (3), 266–285.

Brida, J. G., Disegna, M., and Scuderi, R., 2013. Visitors to two types of museums: Do expenditure patterns differ? *Tourism Economics*, 19 (5), 1027–1047.

Brida, J. G. and Pereyra, J. S., 2009. Tourism Taxation and Environmental Quality in a Model With Vertical differentiation of the accommodation industry. *Tourismos*, 4 (1), 45–62.

Brida, J. G. and Risso, W. A., 2009. A Dynamic Panel Data Study of the German Demand for Tourism in South Tyrol. *Tourism and Hospitality Research*, 9 (4), 305–313.

Brida, J. G. and Scuderi, R., 2013. Determinants of tourist expenditure: A review of microeconometric models. *Tourism Management Perspectives* [online], 6, 28–40. Available from: http://dx.doi.org/10.1016/j.tmp.2012.10.006.

Brida, J. G. and Tokarchuk, O., 2017. Tourists' spending and adherence to shopping plans: The case of the christmas market in Merano, Italy. *Tourism Management* [online], 61, 55–62. Available from: http://dx.doi.org/10.1016/j.tourman.2017.01.016.

Buckley, R. and Mossaz, A. C., 2016. Decision making by specialist luxury travel agents. *Tourism Management* [online], 55, 133–138. Available from: http://dx.doi.org/10.1016/j.tourman.2016.02.002.

Buigut, S., 2018. Effect of terrorism on demand for tourism in Kenya: A comparative analysis. *Tourism and Hospitality Research*, 18 (1), 28–37.

Burdge, R. J., 1969. Levels of Occupational Prestige and Leisure Activity. *Journal of Leisure Research* [online], 1 (3), 262–274. Available from: https://www.tandfonline.com/doi/full/10.1080/00222216.1969.11969738 [Accessed 17 Sep 2018].

Burns, S., 2010. Local authorities, funding tourism services and tourist taxes.

Local Economy, 25 (1), 47–57.

Cai, L. A., 1998. Analyzing household food expenditure patterns on trips and vacations: A tobit model. *Journal of Hospitality and Tourism Research*, 22 (4), 338–358.

Cai, L. A., 1999. Relationship of Household Characteristics and Lodging Expenditure on Leisure Trips. *Journal of Hospitality & Leisure Marketing*, 6 (2), 5–18.

Cai, L. A., Hong, G., and Morrison, A. M., 1995. Household Expenditure Patterns for Tourism Products and Services. *Journal of Travel and Tourism Marketing*, 4 (4), 15–40.

Cameron, A. C. and Trivedi, P. K., 2010. *Microeconometrics using Stata*. Stata Press.

Campos-Soria, J. A., Inchausti-Sintes, F., and Eugenio-Martin, J. L., 2015. Understanding tourists' economizing strategies during the global economic crisis. *Tourism Management* [online], 48, 164–173. Available from: http://dx.doi.org/10.1016/j.tourman.2014.10.019.

Candela, G., Castellani, M., and Mussoni, M., 2015. Keynesian policies for tourism: Taxation without coordination. *Tourism Economics*, 21 (3), 527–541.

Carey, S., Gountas, Y., and Gilbert, D., 1997. Tour operators and destination sustainability. *Tourism Management*, 18 (7), 425–431.

Carnahan, S., Agarwal, R., and Campbell, B., 2010. The Effect of Firm Compensation Structures on the Mobility and Entrepreneurship of Extreme Performers. *Business*, 2657 (October 2015), 1–43.

Cetin, G., 2014. Sustaining Tourism Development Through City Tax: The case of Istanbul. *e-Review of Tourism Research*, 11 (1), 18–25.

Chaitip, P. and Chaiboonsri, C., 2009. Thailand's International Tourism Demand: the Ardl Approach To Cointegration. *Annals of the University of Petroşani, Economics*, 9 (3), 163–184.

Chang, J. J., Lu, L. J., and Hu, S. W., 2011. Congestion Externalities of Tourism, Dutch Disease and Optimal Taxation: Macroeconomic Implications.

Economic Record, 87 (276), 90–108.

Charlet, A. and Owens, J., 2010. An international Perspective on Value Added Tax. *Tax Notes Int'l*, 59 (12), 943–954.

Clarke, H. R. and Ng, Y. K., 1993. Tourism, economic welfare and efficient pricing. *Annals of Tourism Research*, 20 (4), 613–632.

Combs, J. P. and Elledge, B. W., 1979. Effects of a room tax on resort hotel/motels. *National Tax Journal (pre-1986)*, 32 (2), 201–208.

Copeland, B. R. ., 1991. Tourism , Welfare and De-industrialization in a Small Open Economy. *Economica*, 58 (232), 515–529.

Copenhagen Economics, 2007. *Study on reduced VAT applied to goods and services in the Member States of the European Union* [online]. Available from: https://ec.europa.eu/taxation_customs/sites/taxation/files/resources/documents/taxation/vat/how_vat_works/rates/study_reduced_vat.pdf.

Cortés-Jiménez, I., Pulina, M., and Durbarry, R., 2009. Estimation of outbound Italian tourism demand: A monthly dynamic EC-LAIDS model. *Tourism Economics*, 15 (3), 547–565.

Cragg, J. G., 1971. Some Statistical Models for Limited Dependent Variables with Application to the Demand for Durable Goods. *Econometrica*, 39 (5), 829–844.

Cró, S. and Martins, A. M., 2017. Structural breaks in international tourism demand: Are they caused by crises or disasters? *Tourism Management*, 63, 3–9.

Croes, R. R. and Vanegas, M., 2005. An econometric study of tourist arrivals in Aruba and its implications. *Tourism Management*, 26 (6), 879–890.

Crouch, G. I., 1994. The study of international tourism demand. *Journal of travel research* [online], 33 (1), 12–23. Available from: http://www.econis.eu/PPNSET?PPN=260511005.

Crouch, G. I., Oppewal, H., Huybers, T., Dolnicar, S., Louviere, J. J., and Devinney, T., 2007. Discretionary expenditure and tourism consumption: Insights from a choice experiment. *Journal of Travel Research*, 45 (3), 247–

258.

Dall'Aste Brandolini, S. M. and Disegna, M., 2012. Demand for the quality conservation of Venice, Italy, according to different nationalities. *Tourism Economics*, 18 (5), 1019–1050.

Damm, A., Greuell, W., Landgren, O., and Prettenthaler, F., 2017. Impacts of +2 °C global warming on winter tourism demand in Europe. *Climate Services* [online], 7, 31–46. Available from: http://dx.doi.org/10.1016/j.cliser.2016.07.003.

Davies, B. and Mangan, J., 1992. Family expenditure on hotels and holidays. *Annals of Tourism Research*, 19 (4), 691–699.

Debreu, G., 1959. *Theory of Value*. New York: Wiley.

Demir, B. and Javorcik, B., 2018. Don't throw in the towel, throw in trade credit! *Journal of International Economics*, 111, 177–189.

Dimanche, F., 2003. The Louisiana Tax Free Shopping Program for international visitors: A case study. *Journal of Travel Research*, 41 (3), 311–314.

Disegna, M. and Osti, L., 2016. Tourists' expenditure behaviour: The influence of satisfaction and the dependence of spending categories. *Tourism Economics*, 22 (1), 5–30.

Dogru, T., Sirakaya-Turk, E., and Crouch, G. I., 2017a. Remodeling international tourism demand: Old theory and new evidence. *Tourism Management* [online], 60, 47–55. Available from: http://dx.doi.org/10.1016/j.tourman.2016.11.010.

Dogru, T., Sirakaya-Turk, E., and Crouch, G. I., 2017b. Remodeling international tourism demand: Old theory and new evidence. *Tourism Management* [online], 60, 47–55. Available from: http://dx.doi.org/10.1016/j.tourman.2016.11.010.

Dragouni, M., Filis, G., Gavriilidis, K., and Santamaria, D., 2016. Sentiment, mood and outbound tourism demand. *Annals of Tourism Research* [online], 60, 80–96. Available from: http://dx.doi.org/10.1016/j.annals.2016.06.004.

Dube, K. and Nhamo, G., 2018. Climate variability, change and potential impacts on tourism: Evidence from the Zambian side of the Victoria Falls.

Environmental Science and Policy [online], 84 (March), 113–123. Available from: https://doi.org/10.1016/j.envsci.2018.03.009.

Durbarry, R., 2008. Tourism taxes: Implications for tourism demand in the UK. *Review of Development Economics*, 12 (1), 21–36.

Dwyer, L. and Forsyth, P., 1999. Should accommodation providers pay for the Olympics? A critique of the Sydney bed tax. *Tourism and Hospitality Research*, 1 (3), 253–264.

Dwyer, L., Forsyth, P., and Mak, J., 2013. Taxation of Travel and Tourism. *International Handbook on the Economics of Tourism*, 251–265.

Dwyer, L., Forsyth, P., and Spurr, R., 2012. Wither Australian Tourism? Implications of the Carbon Tax. *Journal of Hospitality and Tourism Management* [online], 19 (1), 15–30. Available from: http://linkinghub.elsevier.com/retrieve/pii/S1447677012000186.

Dwyer, L., Forsyth, P., Spurr, R., and Hoque, S., 2012. Economic Impacts of a Carbon Tax on the Australian Tourism Industry. *Journal of Travel Research*, 52 (2), 143–155.

Dwyer, L., Seetaram, N., Forsyth, P., and King, B., 2014. Is the migration-tourism relationship only about VFR? *Annals of Tourism Research* [online], 46, 130–143. Available from: http://dx.doi.org/10.1016/j.annals.2014.03.009.

Eakins, J., 2016. An application of the double hurdle model to petrol and diesel household expenditures in Ireland. *Transport Policy* [online], 47, 84–93. Available from: http://dx.doi.org/10.1016/j.tranpol.2016.01.005.

Etzo, I., Massidda, C., and Piras, R., 2014. Migration and outbound tourism: Evidence from Italy. *Annals of Tourism Research* [online], 48 (1), 235–249. Available from: http://dx.doi.org/10.1016/j.annals.2014.07.002.

Eugenio-Martin, J. L. and Campos-Soria, J. A., 2011. Income and the substitution pattern between domestic and international tourism demand. *Applied Economics*, 43 (20), 2519–2531.

European Commission, 1999. *Council Directive 1999/85/EC* [online]. Europe. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006L0112&rid=6.

European Commission, 2006. *Council Directive 2006/112/EC*. Official Journal of the European Communities.

European Commission, 2017. *What Is an Eu Macro-Regional Strategy?* [online]. Available from: https://pjp-eu.coe.int/en/web/cultural-routes-and-regional-development/eu-macro-regions.

European Commission, 2020. *Tourism-related taxes across the EU* [online]. Internal Market, Industry, Entrepreneurship and SMEs. Available from: https://ec.europa.eu/growth/sectors/tourism/business-portal/financing-your-business/tourism-related-taxes-across-eu_en [Accessed 4 Aug 2020].

Falk, M., 2014. Impact of weather conditions on tourism demand in the peak summer season over the last 50 years. *Tourism Management Perspectives* [online], 9, 24–35. Available from: http://dx.doi.org/10.1016/j.tmp.2013.11.001.

Falk, M. and Hagsten, E., 2018. Short-run impact of the flight departure tax on air travel. *International Journal of Tourism Research*, (August 2018), 37–44.

Fernandes, C. and Karnik, A. V, 2010. Estimating Elasticity of Demand for Tourism in Dubai. *Tourism Analysis* [online], 15 (1), 57–69. Available from: http://www.ingentaconnect.com/content/cog/ta/2010/00000015/00000001/art00006%5Cnhttp://dx.doi.org/10.3727/108354210X12724734223630.

Fish, M., 1982. Taxing international tourism in West Africa. *Annals of Tourism Research*, 9 (1), 91–103.

Fleischer, A. and Pizam, A., 2002. Tourism constraints among Israeli seniors. *Annals of Tourism Research*, 29 (1), 106–123.

Forsyth, P. and Dwyer, L., 2002. Market power and the taxation of domestic and international tourism. *Tourism Economics* [online], 8 (4), 377–400. Available from: http://www.scopus.com/inward/record.url?eid=2-s2.0-0036981463&partnerID=40&md5=4e0947d353e9a6600138cfe819305d70.

Forsyth, P., Dwyer, L., Spurr, R., and Pham, T., 2014. The impacts of Australia's departure tax: Tourism versus the economy? *Tourism Management* [online], 40, 126–136. Available from: http://dx.doi.org/10.1016/j.tourman.2013.05.011.

Fredman, P. and Wikström, D., 2018. Income elasticity of demand for tourism at Fulufjället National Park. *Tourism Economics*, 24 (1), 51–63.

Fujii, E., Khaled, M., and Mak, J., 1985. The exportability of hotel occupancy and other tourist taxes. *National Tax Journal* [online]. Available from: https://www.jstor.org/stable/41792007 [Accessed 30 Jan 2019].

Fullerton, D. and Metcalf, G. E., 2002. Chapter 26 Tax incidence. *In*: [online]. Elsevier, 1787–1872. Available from: http://www.sciencedirect.com/science/article/pii/S1573442002800052.

Gago, A., Labandeira, X., Picos, F., and Rodríguez, M., 2009. Specific and general taxation of tourism activities. Evidence from Spain. *Tourism Management*, 30 (3), 381–392.

Garín-Muñoz, T., 2009. Tourism in Galicia: Domestic and foreign demand. *Tourism Economics*, 15 (4), 753–769.

Garsous, G., Corderi, D., Velasco, M., and Colombo, A., 2017. Tax Incentives and Job Creation in the Tourism Sector of Brazil's SUDENE Area. *World Development*, 96, 87–101.

Gitelson, R. J. and Crompton, J. L., 1984. Insights into the repeat vacation phenomenon. *Annals of Tourism Research*, 11 (2), 199–217.

Gómez-Lobo, A. and González, A., 2008. The use of airport charges for funding general expenditures: The case of Chile. *Journal of Air Transport Management*, 14 (6), 308–314.

Gon Kim, W., Kim, T., Gazzoli, G., Park, Y., Hyuck Kim, S., and Sa Park, S., 2011. Factors affecting the travel expenditure of visitors to Macau, China. *Tourism Economics*, 17 (4), 857–883.

Gooroochurn, N., 2004. Tourism taxation: A theoretical and empirical investigation. *ECOMOD International Conference on Input-Output and General Equilibrium: Data, Modeling and Policy Analysis*, (September 2004), 1–22.

Gooroochurn, N., 2009. Optimal commodity taxation in the presence of tourists. *International Economic Journal*, 23 (2), 197–209.

Gooroochurn, N. and Milner, C., 2005. Assessing indirect tax reform in a tourism-

dependent developing country. *World Development*, 33 (7), 1183–1200.

Gooroochurn, N. and Sinclair, M. T., 2005. Economics of tourism taxation: Evidence from Mauritius. *Annals of Tourism Research*, 32 (2), 478–498.

Gooroochurn, N. and Sinclair, T., 2003. The welfare effects of tourism taxation. *Christel DeHaan Tourism and Travel Research Institute Discussion Papers*, 2.

Gooroochurn, N. and Sinclair, T., 2008. Commodity taxation in the presence of tourists. *Tourism Economics*, 14 (4), 839–856.

Gössling, S., Peeters, P., Ceron, J. P., Dubois, G., Patterson, T., and Richardson, R. B., 2005. The eco-efficiency of tourism. *Ecological Economics*, 54 (4), 417–434.

Greene, W. H., 1993. *Econometric Analysis*. 5th ed. New York: Macmillan.

Greene, W. H., 2003. *Econometric Analysis*. Fifth. Pearson Education, Inc.

Häckner, J. and Herzing, M., 2016. Welfare effects of taxation in oligopolistic markets. *Journal of Economic Theory* [online], 163, 141–166. Available from: http://dx.doi.org/10.1016/j.jet.2016.01.007.

Hagemann, R. P., 1981. The determinants of household vacation travel: some empirical evidence. *Applied Economics* [online], 13 (2), 225–234. Available from: https://doi.org/10.1080/00036848100000027.

Heckman, J. J., 1979. Sample Selection Bias as a Specification Error. *Econometrica*, 47 (1), 153–161.

Heien, D. and Wesseils, C. R., 1990. Demand Systems Estimation with Microdata: A Censored Regression Approach. *Journal of Business & Economic Stastistics*, 8 (3), 365–371.

Hicks, J., 1939. Foundations of Welfare Economics. *The Economic Journal*, 49 (196), 696–712.

Hicks, J., 1946. *Value and capital; an inquiry into some fundamental principles of economic theory.* Oxford: Clarendon Press.

Hiemstra, S. J. and Ismail, J. A., 1992. Analysis of Room Taxes Levied on the Lodging Industry. *Journal of Travel Research*, 31, 42–49.

Hiemstra, S. J. and Ismail, J. A., 1993. Incidence of the Impacts of Room Taxes on the Lodging Industry. *Journal of Hospitality & Tourism Research*, 14 (2), 22–26.

Hiemstra, S. J. and Ismail, J. A., 2001. Research note to 'incidence of the impacts of room taxes on the lodging industry': Revision to article published in spring 1993 issue of JTR. *Journal of Travel Research*, 39 (3), 319–320.

Holzner, M., 2011. Tourism and economic development: The beach disease? *Tourism Management* [online], 32 (4), 922–933. Available from: http://dx.doi.org/10.1016/j.tourman.2010.08.007.

Hong, G., Fan, J. X., and Palmer, L., 2005. Leisure Travel Expenditure Patterns by Family Life Cycle Stages. *Journal of Travel & Tourism Marketing*, 8408 (February 2014), 37–41.

Hong, G. S., Kim, S. Y., and Lee, J., 1999. Travel Expenditure Patterns of Elderly Households in the us. *Tourism Recreation Research*, 24 (1), 43–52.

Hong Tsui, K. W., 2017. Does a low-cost carrier lead the domestic tourism demand and growth of New Zealand? *Tourism Management* [online], 60, 390–403. Available from: http://dx.doi.org/10.1016/j.tourman.2016.10.013.

Howrey, E. P., 1980. The Role of Time Series Analysis in Econometric Model Evaluation. *In*: *Evaluation of Econometric Models*. Academic Press, 275–307.

Hughes, H. L., 1981. A tourism tax - the cases for and against. *International Journal of Tourism Management*, 2 (3), 196–206.

Ihalanayake, R., 2012. Economic effects of tourism tax changes in Australia: Empirical evidence from a computable general equilibrium model. *Tourism Economics*, 18 (1), 181–202.

Ihalanayake, R. and Divisekera, S., 2006. The tourism tax burden: evidence from Australia. *Tourism Economics*, 12 (2), 247–262.

Im, K., Pesaran, H., and Shin, Y., 2003. Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, 115, 53–74.

Jang, S. C. (Shawn) and Ham, S., 2009. A double-hurdle analysis of travel expenditure: Baby boomer seniors versus older seniors. *Tourism*

Management [online], 30 (3), 372–380. Available from: http://dx.doi.org/10.1016/j.tourman.2008.08.005.

Jang, S. C., Yu, L., and Pearson, T. E., 2003. Chinese travellers to the United States: A comparison of business travel and visiting friends and relatives. *Tourism Geographies*, 5 (1), 87–108.

Jarkko, H. and Kosonen, T., 2014. The inefficiency of reduced VAT rates: Evidence from restaurant industry. *Government Institute for Economic Research*, 1–43.

Jensen, T. C. and Wanhill, S., 2002. Tourism's taxing times: Value added tax in Europe and Denmark. *Tourism Management*, 23 (1), 67–79.

Johansson-Stenman, O., 2002. Estimating individual driving distance by car and public transport use in Sweden. *Applied Economics*, 34 (8), 959–967.

Josep, B., Pazienza, P., and Mar, V., 2012. Arguments in favor of taxing tourism: The Lanzarote case study. *Tourismos*, 7 (2), 401–416.

Jucan, C. N. and Jucan, M. S., 2013. Travel and Tourism as a Driver of Economic Recovery. *Procedia Economics and Finance* [online], 6 (13), 81–88. Available from: http://www.sciencedirect.com/science/article/pii/S2212567113001172.

Kao, C., 1999. Spurious regression and residual-based tests for cointegration in panel data. *Journal of Econometrics*, 90 (1), 1–44.

Kato, A., Kwak, S., and Mak, J., 2011. Using the property tax to appropriate gains from tourism. *Journal of Travel Research*, 50 (2), 144–153.

Ketenci, N., 2010. Cointegration analysis of tourism demand for Turkey. *Applied Econometrics and International Development*, 10 (1), 87–110.

Kim, J. and Lee, C. K., 2017. Role of tourism price in attracting international tourists: The case of Japanese inbound tourism from South Korea. *Journal of Destination Marketing and Management* [online], 6 (1), 76–83. Available from: http://dx.doi.org/10.1016/j.jdmm.2016.03.002.

Koo, T. T. R., Lim, C., and Dobruszkes, F., 2017. Causality in direct air services and tourism demand. *Annals of Tourism Research* [online], 67 (May), 67–77. Available from: http://dx.doi.org/10.1016/j.annals.2017.08.004.

Labeaga, J. M., 1999. A double-hurdle rational addiction model with heterogeneity: Estimating the demand for tobacco. *Journal of Econometrics*, 93 (1), 49–72.

Lawson, R., 1991. Patterns Of Tourist Expenditure And Types Of Vacation Across The Family Life Cycle. *Journal of Travel Research* [online], 29 (4), 12–18. Available from: http://journals.sagepub.com/doi/10.1177/004728759102900403.

Lee, H. A., Denizci Guillet, B., and Law, R., 2013. An Examination of the Relationship between Online Travel Agents and Hotels: A Case Study of Choice Hotels International and Expedia.com. *Cornell Hospitality Quarterly*, 54 (1), 95–107.

Lee, H. C., 2002. Regional flows of recreational boater expenditures on trips in Michigan. *Journal of Travel Research*, 41 (1), 77–84.

Lee, S. K., 2014. Revisiting the impact of bed tax with spatial panel approach. *International Journal of Hospitality Management* [online], 41, 49–55. Available from: http://dx.doi.org/10.1016/j.ijhm.2014.04.010.

Leicester, A., Levell, P., and Rasul, I., 2012. *Tax and benefit policy: insights from behavioural economics* [online]. IFS Commentary C125. Available from: http://www.ifs.org.uk/conferences/hmrc24jul_al.pdf.

Lejárraga, I. and Walkenhorst, P., 2013. Economic policy, tourism trade and productive diversification. *International Economics* [online], 135–136, 1–12. Available from: http://dx.doi.org/10.1016/j.inteco.2013.09.001.

Leones, J., Colby, B., and Crandall, K., 1998. Tracking expenditures of the elusive nature tourists of southeastern Arizona. *Journal of Travel Research*, 36 (3), 56–64.

Li, K. X., Jin, M., and Shi, W., 2018. Tourism as an important impetus to promoting economic growth: A critical review. *Tourism Management Perspectives* [online], 26 (October 2017), 135–142. Available from: https://doi.org/10.1016/j.tmp.2017.10.002.

Lim, C., 1997. Review of international tourism demand models. *Annals of Tourism Research* [online], 24 (4), 835–849. Available from:

http://linkinghub.elsevier.com/retrieve/pii/S0160738397000492.

Lim, C., 1999. A Meta-Analytic Review of international tourism demand. *Journal of Travel Research*, 37 (3), 273–284.

Lim, C., McAleer, M., and Min, J. C. H., 2009. ARMAX modelling of international tourism demand. *Mathematics and Computers in Simulation*, 79 (9), 2879–2888.

Litvin, S. W., Crotts, J. C., Blackwell, C., and Styles, A. K., 2006. Expenditures of accommodations tax revenue: A South Carolina study. *Journal of Travel Research*, 45 (2), 150–157.

Logar, I., 2010. Sustainable tourism management in Crikvenica, Croatia: An assessment of policy instruments. *Tourism Management* [online], 31 (1), 125–135. Available from: http://dx.doi.org/10.1016/j.tourman.2009.02.005.

Lyu, S. O. and Noh, E. J., 2017. Shopping decisions of international tourists to Korea: The Heckman sample selection approach. *Journal of Destination Marketing and Management* [online], 6 (4), 436–443. Available from: http://dx.doi.org/10.1016/j.jdmm.2016.07.001.

Maddala, G. S., 1983. *Limited-dependent and qualitative variables in econometrics* [online]. Cambridge University Press. Available from: https://books.google.co.uk/books?hl=en&lr=&id=-Ji1ZaUg7gcC&oi=fnd&pg=PR11&dq=Limited-Dependent+and+Qualitative+Variables+in+Econometrics&ots=7g1u2GoTOJ&sig=ioGIe6UVMyqqwa_qFWuWJoxIYEs#v=onepage&q=Limited-Dependent and Qualitative Variables in Econometrics [Accessed 17 Sep 2018].

Maddala, G. S. and Wu, S., 1999. A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test. *Oxford Bulletin of Economics and Statistics*, 61 (s1), 631–652.

Mahadevan, R., Amir, H., and Nugroho, A., 2017. How Pro-Poor and Income Equitable Are Tourism Taxation Policies in a Developing Country? Evidence from a Computable General Equilibrium Model. *Journal of Travel Research*, 56 (3), 334–346.

Mahangila, D. and Anderson, W., 2017. Tax administrative burdens in the tourism sector in Zanzibar: Stakeholders' perspectives. *SAGE Open*, 7 (4).

Mak, J., 1988. Taxing Hotel Room Rentals in the U.S. *Journal of Travel Research*, 10–15.

Mak, J., 2006. Taxation of travel and tourism. *In*: Dwyer, L. and F. P., ed. *International Handbook on the Economics of Tourism*. Edward Elgar Publishing Limited, 251–265.

Mak, J., 2008. Taxing cruise tourism: Alaska's head tax on cruise ship passengers. *Tourism Economics*, 14 (3), 599–614.

Mak, J., 2015. Research note: Are hotel property taxes fully passed on to hotel guests? Implications from recent research on property tax incidence. *Tourism Economics*, 21 (4), 899–905.

Mak, J., Moncur, J., and Yonamine, D., 1978. How or How Not to Measure Visitor Expenditures. *Journal of Travel Research*, 16 (1), 1–4.

Maldives Times, 2017. In 2018: what will be the new tax? [online], 2017. Available from: https://maldivestimes.com/in-2018-what-will-be-the-new-tax/ [Accessed 19 Sep 2019].

Manente, M. and Zanette, M., 2010. Macroeconomic effects of a vat reduction in the italian hotels & restaurants industry. *Economic Systems Research*, 22 (4), 407–425.

Marcussen, C. H., 2011. Determinants of spending by Danish travellers. *Anatolia*, 22 (1), 47–55.

Marrocu, E., Paci, R., and Zara, A., 2015. Micro-economic determinants of tourist expenditure: A quantile regression approach. *Tourism Management* [online], 50, 13–30. Available from: http://dx.doi.org/10.1016/j.tourman.2015.01.006.

Martin, C. A. and Witt, S. F., 1988. Substitute prices in models of tourism demand. *Annals of Tourism Research*, 15 (2), 255–268.

Martins, L. F., Gan, Y., and Ferreira-Lopes, A., 2017. An empirical analysis of the influence of macroeconomic determinants on World tourism demand. *Tourism Management* [online], 61, 248–260. Available from: http://dx.doi.org/10.1016/j.tourman.2017.01.008.

Massidda, C. and Piras, R., 2015. Does internal migration affect Italian domestic tourism? A panel data analysis. *Tourism Economics*, 21 (3), 581–600.

Matthew, G., Nuttall, W. J., Mestel, B., and Dooley, L. S., 2017. A dynamic simulation of low-carbon policy influences on endogenous electricity demand in an isolated island system. *Energy Policy* [online], 109 (March), 121–131. Available from: http://dx.doi.org/10.1016/j.enpol.2017.06.060.

Mayor, K. and Tol, R. S. J., 2007. The impact of the UK aviation tax on carbon dioxide emissions and visitor numbers. *Transport Policy*, 14 (6), 507–513.

Mayor, K. and Tol, R. S. J., 2010. The impact of European climate change regulations on international tourist markets. *Transportation Research Part D: Transport and Environment* [online], 15 (1), 26–36. Available from: http://dx.doi.org/10.1016/j.trd.2009.07.002.

Melenberg, B. and Van Soest, A., 1996. Parametric and semi-parametric modelling of vacation expenditures.pdf. *Journal of Applied Econometrics*, 11, 59–76.

Meng, S. and Pham, T., 2017. The impact of the Australian carbon tax on the tourism industry. *Tourism Economics*, 23 (3), 506–522.

Mergoupis, T. and Steuer, M., 2003. Holiday taking and income. *Applied Economics*, 35 (3), 269–284.

Ministry of Tourism, 2001. *Tourism Statistics*. Tourism Statistics.

Ministry of Tourism, 2018. *Tourism Yearbook 2018*.

Morley, C. L., 1994. The use of CPI for tourism prices in demand modelling. *Tourism Management*, 15 (5), 342–346.

Mottaleb, K. A., Rahut, D. B., and Mishra, A. K., 2017. Consumption of food away from home in Bangladesh: Do rich households spend more? *Appetite* [online], 119, 54–63. Available from: https://doi.org/10.1016/j.appet.2017.03.030.

Nevin, M., 1999. Are high taxes damaging British tourism? *Journal of Vacation Marketing* [online], 5 (1), 94–100. Available from: http://jvm.sagepub.com/cgi/content/abstract/5/1/94.

Newman, C., Henchion, M., and Matthews, A., 2003. A double-hurdle model of Irish household expenditure on prepared meals. *Applied Economics*, 35 (9), 1053–1061.

Nicolau, J. L. and Más, F. J., 2005. Heckit modelling of tourist expenditure: Evidence from Spain. *International Journal of Service Industry Management*, 16 (3), 271–293.

Nicolau, J. L. and Más, F. J., 2009. Simultaneous analysis of whether and how long to go on holidays. *The Service Industries Journal* [online], 29 (8), 1077–1092. Available from: http://www.tandfonline.com/doi/full/10.1080/02642060902764467.

Oom Do Valle, P., Pintassilgo, P., Matias, A., and André, F., 2012. Tourist attitudes towards an accommodation tax earmarked for environmental protection: A survey in the Algarve. *Tourism Management* [online], 33 (6), 1408–1416. Available from: http://dx.doi.org/10.1016/j.tourman.2012.01.003.

Oppermann, M., 1996. Visitation of tourism attractions and tourist expenditure patterns - repeat versus first-time visitors. *Asia Pacific Journal of Tourism Research*, 1 (1), 61–68.

Pablo-Romero, M. D. P. and Molina, J. A., 2013. Tourism and economic growth: A review of empirical literature. *Tourism Management Perspectives* [online], 8, 28–41. Available from: http://dx.doi.org/10.1016/j.tmp.2013.05.006.

Palmer-Tous, T., Riera-Font, A., and Rosselló-Nadal, J., 2007. Taxing tourism: The case of rental cars in Mallorca. *Tourism Management*, 28 (1), 271–279.

Palmer, R. W., 1993. Tourism and taxes: the case of Barbados. *In*: Gayle, D. J. and Goodrich, J. N., eds. *Tourism Marketing and Management in the Caribbean*. London: Routledge, 59–68.

Palmer, T. and Riera, A., 2003. Tourism and environmental taxes. With special reference to the 'Balearic ecotax'. *Tourism Management*, 24 (6), 665–674.

Pareto, V., 1897. The New Theories of Economics. *Journal of Political Economy*, 5 (4), 485–502.

Pareto, V., 1898. Cours d'Economie Politique. *Journal of Political Economy*, 6

(4), 549–552.

Pedroni, P., 1999. Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors. *Oxford Bulletin of Economics and Statistics*, 61, 653–670.

Pedroni, P., 2001. Fully modified OLS for heterogeneous cointegrated panels. *Advances in econometrics*, 15, 93–130.

Pedroni, P., 2004. Panel Cointegration: Asymptotic and Finite Sample Properties of Pooled Time Series Tests with an Application to the PPP Hypothesis. *Econometric Theory* [online], 20 (03), 597–625. Available from: http://www.journals.cambridge.org/abstract_S0266466604203073 [Accessed 23 Aug 2019].

Peitz, M., 1995. Utility maximization in models of discrete choice. *Economics Letters*, 49 (1), 91–94.

Peng, B., Song, H., Crouch, G. I., and Witt, S. F., 2015. A Meta-Analysis of International Tourism Demand Elasticities. *Journal of Travel Research* [online], 54 (5), 611–633. Available from: http://journals.sagepub.com/doi/10.1177/0047287514528283.

Pham, T. D., Nghiem, S., and Dwyer, L., 2017a. The determinants of Chinese visitors to Australia: A dynamic demand analysis. *Tourism Management* [online], 63, 268–276. Available from: http://dx.doi.org/10.1016/j.tourman.2017.06.015.

Pham, T. D., Nghiem, S., and Dwyer, L., 2017b. The determinants of Chinese visitors to Australia: A dynamic demand analysis. *Tourism Management*.

Pintassilgo, P. and João Albino, S., 2007. 'Tragedy of the commons' in the tourism accommodation industry. *Tourism Economics*, 13 (2), 209–224.

Pizam, A. and Jansen-verbeke, M., 1997. Are all tourists alike, regardless of nationality? *Journal of International Hospitality, Leisure and Tourism Management*, 1 (1), 19–38.

Plog, S. C., 2002. The Power of Psychographics and the Concept of Venturesomeness. *Journal of Travel Research* [online], 40 (3), 244–251. Available from:

http://journals.sagepub.com/doi/10.1177/004728750204000302 [Accessed 17 Sep 2018].

Ponjan, P. and Thirawat, N., 2016. Impacts of Thailand's tourism tax cut: A CGE analysis. *Annals of Tourism Research*, 61, 45–62.

Pudney, S., 1989. *Modelling individual choice : the econometrics of corners, kinks and holes*. london: Blackwell.

Qureshi, M. I., Hassan, M. A., Hishan, S. S., Rasli, A. M., and Zaman, K., 2017. Dynamic linkages between sustainable tourism, energy, health and wealth: Evidence from top 80 international tourist destination cities in 37 countries. *Journal of Cleaner Production* [online], 158, 143–155. Available from: http://dx.doi.org/10.1016/j.jclepro.2017.05.001.

Rey-Maquieira, J., Lozano, J., and Gómez, C. M., 2009. Quality standards versus taxation in a dynamic environmental model of a tourism economy. *Environmental Modelling and Software*, 24 (12), 1483–1490.

Rodríguez, X. A., Martínez-Roget, F., and González-Murias, P., 2018. Length of stay: Evidence from Santiago de Compostela. *Annals of Tourism Research* [online], 68 (September 2017), 9–19. Available from: https://doi.org/10.1016/j.annals.2017.11.001.

Rodríguez, X. A., Martínez-Roget, F., and Pawlowska, E., 2012. Academic tourism demand in Galicia, Spain. *Tourism Management* [online], 33 (6), 1583–1590. Available from: http://dx.doi.org/10.1016/j.tourman.2012.01.010.

Romero, I., Fernández-Serrano, J., and Cáceres-Carrasco, F. R., 2020. Tour operators and performance of SME hotels: Differences between hotels in coastal and inland areas. *International Journal of Hospitality Management* [online], 85 (August 2019), 102348. Available from: https://doi.org/10.1016/j.ijhm.2019.102348.

Rosselló-Nadal, J. and HE, J., 2019. Tourist arrivals versus tourist expenditures in modelling tourism demand. *Tourism Economics*, 135481661986781.

Russu, P., 2012. Dynamics in a environmental model with tourism taxation. *International Journal of Mathematical Models and Methods in Applied*

Sciences, 6 (3), 443–451.

Saayman, A., Viljoen, A., and Saayman, M., 2018. Africa's outbound tourism: An Almost Ideal Demand System perspective. *Annals of Tourism Research* [online], 73 (June), 141–158. Available from: https://doi.org/10.1016/j.annals.2018.06.005.

Saayman, M. and Saayman, A., 2012. Determinants of Spending: an Evaluation of Three Major Sporting Events. *International Journal of Tourism Research*, 14 (27 March 2011), 124–138.

Salgado-Barandela, J., Barajas, Á., and Sánchez-Fernández, P., 2018. Determinants of the spending of sporting tourists: The case of attendees at professional basketball. *European Research on Management and Business Economics* [online], (2017), 1–9. Available from: https://doi.org/10.1016/j.iedeen.2018.05.001.

Samitas, A., Asteriou, D., Polyzos, S., and Kenourgios, D., 2018. Terrorist incidents and tourism demand: Evidence from Greece. *Tourism Management Perspectives* [online], 25 (October 2017), 23–28. Available from: https://doi.org/10.1016/j.tmp.2017.10.005.

Schiff, A. and Becken, S., 2011. Demand elasticity estimates for New Zealand tourism. *Tourism Management* [online], 32 (3), 564–575. Available from: http://dx.doi.org/10.1016/j.tourman.2010.05.004.

Schubert, S. F., 2010. Coping with externalities in tourism: a dynamic optimal taxation approach. *Tourism Economics*, 16 (2), 321–343.

Schubert, S. F., Matias, Á., and Costa, C. M. G., 2012. A general equilibrium analysis of casino taxation in Portugal. *Tourism Economics*, 18 (3), 475–494.

Seetaram, N., 2010. Use of Dynamic Panel Cointegration Approach to Model International Arrivals to Australia. *Journal of Travel Research* [online], 49 (4), 414–422. Available from: http://journals.sagepub.com/doi/10.1177/0047287509346992.

Seetaram, N., 2012. Immigration and international inbound tourism: Empirical evidence from Australia. *Tourism Management*, 33 (6), 1535–1543.

Seetaram, N. and Dwyer, L., 2009. Immigration and tourism demand in Australia:

A panel data analysis. *Anatolia*, 20 (1), 212–222.

Seetaram, N., Forsyth, P., and Dwyer, L., 2016. Measuring price elasticities of demand for outbound tourism using competitiveness indices. *Annals of Tourism Research*, 56 (1), 65–79.

Seetaram, N., Song, H., and Page, S. J., 2014. Air Passenger Duty and Outbound Tourism Demand from the United Kingdom. *Journal of Travel Research*, 53 (4), 476–487.

Seetaram, N., Song, H., Ye, S., and Page, S., 2018. Estimating willingness to pay air passenger duty. *Annals of Tourism Research* [online], 72 (June), 85–97. Available from: https://doi.org/10.1016/j.annals.2018.07.001.

Shahzad, S. J. H., Shahbaz, M., Ferrer, R., and Kumar, R. R., 2017. Tourism-led growth hypothesis in the top ten tourist destinations: New evidence using the quantile-on-quantile approach. *Tourism Management*, 60, 223–232.

Shareef, R. and McAleer, M., 2008. Modelling international tourism demand and uncertainty in Maldives and Seychelles: A portfolio approach. *Mathematics and Computers in Simulation*, 78 (2–3), 459–468.

Sheng, L., 2011. Taxing tourism and subsidizing non-tourism: A welfare-enhancing solution to 'Dutch disease' ? *Tourism Management* [online], 32 (5), 1223–1228. Available from: http://dx.doi.org/10.1016/j.tourman.2010.09.009.

Sheng, L., 2017. Factors determining the success or failure of a tourism tax: a theoretical model. *Tourism Review*, 72 (3), 274–287.

Sheng, L. and Tsui, Y., 2009. Taxing tourism: Enhancing or reducing welfare? *Journal of Sustainable Tourism*, 17 (5), 627–635.

Sinclair, M. T., Blake, A., and Gooroochurn, N., 2005. Modelling tourism impacts on small island economies: Evidence from Cyprus, Malta and Mauritius. *World Forum on Small Island Developing States*, 1–14.

Slutsky, E., 1915. Sulla teoria del bilancio del consumatore. *Giornale degli Economisti*, 51, 1–26.

Smallwood, D. and Blaylock, J., 1981. Impact of Household Size and Income on Food Spending Patterns. *Economics and Statistics Service*, 1–24.

Van Soest, A. and Kooreman, P., 1987. A micro-econometric analysis of vacation behaviour. *Journal of Applied Econometrics*, 2 (3), 215–226.

Sokhanvar, A., Çiftçioğlu, S., and Javid, E., 2018. Another look at tourism-economic development nexus. *Tourism Management Perspectives*, 26 (July 2017), 97–106.

Song, H., Dwyer, L., Li, G., and Cao, Z., 2012. Tourism economics research: A review and assessment. *Annals of Tourism Research* [online], 39 (3), 1653–1682. Available from: http://dx.doi.org/10.1016/j.annals.2012.05.023.

Song, H. and Gang, L., 2008. Tourism Demand Modelling and Forecasting A Review of Recent Research. *Tourism Management*, 29 (2), 203–220.

Song, H. and Li, G., 2008. Tourism demand modelling and forecasting-A review of recent research. *Tourism Management*, 29 (2), 203–220.

Song, H., Qiu, R. T. R., and Park, J., 2019. A review of research on tourism demand forecasting. *Annals of Tourism Research* [online], 75 (September 2018), 338–362. Available from: https://doi.org/10.1016/j.annals.2018.12.001.

Song, H., Seetaram, N., and Ye, S., 2019. The effect of tourism taxation on tourists' budget allocation. *Journal of Destination Marketing and Management* [online], 11 (December 2018), 32–39. Available from: https://doi.org/10.1016/j.jdmm.2018.12.001.

Søren, J., 1991. Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models. *Econometrica*, 59 (6), 1551–1580.

Spengler, J. O. and Uysal, M., 1989. Considerations in the hotel taxation process. *International Journal of Hospitality Management*, 8 (4), 309–316.

Sun, Y. Y., 2016. Decomposition of tourism greenhouse gas emissions: Revealing the dynamics between tourism economic growth, technological efficiency, and carbon emissions. *Tourism Management* [online], 55, 326–336. Available from: http://dx.doi.org/10.1016/j.tourman.2016.02.014.

Tao, Y. G. and Huang, Z. F., 2014. Review of accounting for carbon dioxide emissions from tourism at different spatial scales. *Shengtai Xuebao/ Acta Ecologica Sinica* [online], 34 (5), 246–254. Available from:

http://dx.doi.org/10.1016/j.chnaes.2014.03.007.

Thibaut, E., Vos, S., and Scheerder, J., 2014. Hurdles for sports consumption? The determining factors of household sports expenditures. *Sport Management Review* [online], 17 (4), 444–454. Available from: http://dx.doi.org/10.1016/j.smr.2013.12.001.

Thrane, C. and Farstad, E., 2011. Domestic tourism expenditures: The non-linear effects of length of stay and travel party size. *Tourism Management* [online], 32 (1), 46–52. Available from: http://dx.doi.org/10.1016/j.tourman.2009.11.002.

Tobin, J., 1958. Estimation of Relationships for Limited Dependent Variables. *Econometrica* [online], 26 (1), 24. Available from: http://www.jstor.org/stable/1907382?origin=crossref.

Toivonen, T., 2004. Changes in the propensity to take holiday trips abroad in EU countries between 1985 and 1997. *Tourism Economics*, 10 (4), 403–417.

Tol, R. S. J., 2007. The impact of a carbon tax on international tourism. *Transportation Research Part D: Transport and Environment*, 12 (2), 129–142.

Um, S. and Crompton, J. L., 1990. Attitude determinants in tourism destination choice. *Annals of Tourism Research*, 17 (3), 432–448.

Untong, A., Ramos, V., Kaosa-Ard, M., and Rey-Maquieira, J., 2015. Tourism demand analysis of Chinese arrivals in Thailand. *Tourism Economics*, 21 (6), 1221–1234.

UNWTO, 1998. *Tourism Taxation: Striking a Fair Deal*. Madrid, Spain: United Nations World Tourism organization.

UNWTO, 2018. *UNWTO Tourism Highlights: 2018 Edition* [online]. World Tourism Organization (UNWTO). Available from: https://www.e-unwto.org/doi/book/10.18111/9789284419876 [Accessed 16 Sep 2019].

Do Valle, P. O., Pintassilgo, P., Matias, A., and André, F., 2012. Tourist attitudes towards an accommodation tax earmarked for environmental protection: A survey in the Algarve. *Tourism Management* [online], 33 (6), 1408–1416. Available from: http://dx.doi.org/10.1016/j.tourman.2012.01.003.

Varian, H. R., 1992. *Microeconomic analysis*. Norton.

Vjekoslav, B., Bejaković, P., and Anton, D., 2012. Tax System as a Factor of Tourism Competitiveness: The Case of Croatia. *Procedia - Social and Behavioral Sciences* [online], 44, 250–257. Available from: http://linkinghub.elsevier.com/retrieve/pii/S1877042812011482.

Vladimirov, Z., 2012. Customer satisfaction with the Bulgarian tour operators and tour agencies' websites. *Tourism Management Perspectives* [online], 4, 176–184. Available from: http://dx.doi.org/10.1016/j.tmp.2012.07.003.

Wang, L., Fang, B., and Law, R., 2018. Effect of air quality in the place of origin on outbound tourism demand: Disposable income as a moderator. *Tourism Management* [online], 68, 152–161. Available from: https://doi.org/10.1016/j.tourman.2018.03.007.

Wang, Y. and Davidson, M. C. G., 2010. A review of micro-analyses of tourist expenditure. *Current Issues in Tourism*, 13 (6), 507–524.

Wang, Y., Rompf, P., Severt, D., and Peerapatdit, N., 2006. Examining and identifying the determinants of travel expenditure patterns. *International Journal of Tourism Research* [online], 8 (5), 333–346. Available from: http://dx.doi.org/10.1002/jtr.583.

Wang, Y. S., 2009. The impact of crisis events and macroeconomic activity on Taiwan's international inbound tourism demand. *Tourism Management* [online], 30 (1), 75–82. Available from: http://dx.doi.org/10.1016/j.tourman.2008.04.010.

Wanhill, S., 1995. VAT rates and the UK tourism and leisure industry. *Tourism Economics*, 1 (3), 211–224.

Wanhill, S. R. C., 2006. Measuring the Economic Impact of Tourism. *The Service Industries Journal* [online], 3 (1), 9–20. Available from: http://www.scopus.com/inward/record.url?eid=2-s2.0-4243131251&partnerID=tZOtx3y1.

Ward, R. W., Moon, W., and Medina, S., 2001. Measuring the impact of generic promotions of U.S. beef: An application of double-hurdle and time series models. *International Food and Agribusiness Management Review*, 4 (4),

361–371.

Weagley, R. O. and Huh, E., 2004. Leisure expenditures of retired and near-retired households. *Journal of Leisure Research*, 36 (1), 101–127.

Weston, R., 1983. The ubiquity of room taxes. *Tourism Management*, 4 (3), 194–198.

Wiley, O. and Debreu, G., 1964. CONTINUITY PROPERTIES OF PARETIAN UTILITY*. *International Economic Review ECONOMslIC RZEVIEW* [online], 5 (3), 285–293. Available from: http://www.jstor.org/stable/2525513 [Accessed 29 May 2018].

Witt, S. F. and Witt, C. A., 1995. Forecasting tourism demand: A review of empirical research. *International Journal of Forecasting*, 11 (3), 447–475.

Wold, H., 1943. A synthesis of pure demand analysis. *Scandinavian Actuarial Journal* [online], 1943 (1–2), 85–118. Available from: http://www.tandfonline.com/doi/abs/10.1080/03461238.1943.10404744 [Accessed 29 May 2018].

Wu, C., Jiang, Q., and Yang, H., 2018. Changes in cross-strait aviation policies and their impact on tourism flows since 2009. *Transport Policy* [online], 63 (March 2017), 61–72. Available from: https://doi.org/10.1016/j.tranpol.2017.11.008.

Wu, L., Zhang, J., and Fujiwara, A., 2013. Tourism participation and expenditure behaviour: Analysis using a scobit based discrete-continuous choice model. *Annals of Tourism Research* [online], 40 (1), 1–17. Available from: http://dx.doi.org/10.1016/j.annals.2012.09.002.

Zanin, L. and Marra, G., 2012. A Comparative Study of the Use of Generalized Additive Models and Generalized Linear Models in Tourism Research. *International Journal of Tourism Research*, 14, 451–468.

Zellner, A., 1962. An Efficient Method of Estimating Seemingly Unrelated Regressions and Tests for Aggregation Bias. *Journal of the American Statistical Association* [online], 57 (298), 348–368. Available from: http://www.tandfonline.com/doi/abs/10.1080/01621459.1962.10480664 [Accessed 27 Mar 2019].

Zhang, H. and Yang, Y., 2018. Prescribing for the tourism-induced Dutch disease: A DSGE analysis of subsidy policies. *Tourism Economics* [online], 135481661881304. Available from: http://journals.sagepub.com/doi/10.1177/1354816618813046.

Zhang, J. and Zhang, Y., 2018. Carbon tax, tourism CO2emissions and economic welfare. *Annals of Tourism Research* [online], 69 (December 2017), 18–30. Available from: https://doi.org/10.1016/j.annals.2017.12.009.

Zheng, B. and Zhang, Y., 2013. Household Expenditures for Leisure Tourism in the USA, 1996 and 2006. *International Journal of Tourism Research*, 15, 197–208.

Appendices

Appendix 1. Country-level data

EU Country	Mean					
	Tax (€)	Tourism Expenditure (€)	HH Income (€)	Standard VAT rate (%)	Average Reduced Rate (%)	Part. Rate
Belgium	270.76	714.85	40894.48	21	6	0.920
Bulgaria	45.17	50.50	4993.01	20	14	0.669
Croatia	136.21	199.77	14253.77	23	19	0.912
Cyprus	134.35	588.16	42149.10	15	5	0.626
Czech	116.51	262.94	14504.82	20	13	0.989
Denmark	620.01	1128.79	58601.43	25	19	0.995
Estonia	28.10	139.20	10276.88	20	13	0.296
Finland	309.71	785.89	46932.33	23	7	0.968
France	263.61	619.24	37034.86	20	11	0.835
Germany	220.96	811.09	41601.86	19	14	0.943
Greece	73.89	169.83	27447.59	23	19	0.997
Hungary	119.32	169.49	10304.49	25	18	0.772
Ireland	522.84	1399.63	47137.43	21	6	0.926
Italy	135.59	400.67	29043.78	20	11	0.447
Latvia	66.40	127.95	7541.72	21	12	0.611
Lithuania	27.72	63.04	10433.49	21	14	0.409
Luxembourg	157.93	688.14	16959.89	15	4	0.883
Malta	217.67	360.83	21671.24	18	14	0.967
Poland	178.19	246.95	11035.77	22	8	0.878
Portugal	76.35	266.28	21987.65	21	12	0.848
Romania	65.24	69.93	5885.92	24	10	0.898
Slovakia	103.90	154.61	11081.29	19	15	0.925
Slovenia	287.55	511.90	22952.16	20	10	0.996
Spain	75.31	461.52	30564.05	18	13	0.577
UK	365.23	917.49	34671.47	18	13	0.922

Appendix 2. Results of stepwise regression

Variables	Marginal Effects of Probit Estimation	OLS regressions
	dy	*Log (Exp)*
Average Reduced VAT	-0.00266***	
	(0.000655)	
Log (Tax)		0.538***
		(0.00334)
Log (Tax) * Children		-0.127***
		(0.00336)
Log (Tax) * Single		0.0505***
		(0.00319)
Log (Tax) * Female		-0.0339***
		(0.00314)
Log (Tax) * AMIncome		-0.210***
		(0.00317)
Log (Income)	0.142***	0.471***
	(0.00221)	(0.0147)
Higher Education	-0.00623***	-0.0205**
	(0.00219)	(0.00966)
Single	-0.0168***	-0.173***
	(0.00212)	(0.0165)
Employed	-0.00744***	
	(0.00233)	
Densely	0.0547***	0.252***
	(0.00219)	(0.0112)
Intermediate	0.0205***	0.124***
	(0.00251)	(0.0127)
Female	0.00779***	0.104***
	(0.00190)	(0.0163)
Children	0.0464***	0.616***
	(0.00271)	(0.0203)
Number of Household Members	-0.00334***	0.0471***
	(0.00113)	(0.00524)
Age	0.000616**	
	(0.000285)	
Age Squared	-6.83e-06***	
	(2.39e-06)	
Average Median Income	-0.00737***	0.437***
	(0.00280)	(0.0204)
Adriatic	-0.251***	-1.125***
	(0.00639)	(0.0814)
Alpine	0.0387***	0.0418**
	(0.00513)	(0.0188)
Baltic	-0.0880***	-0.602***
	(0.00463)	(0.0784)
Danube		-1.028***
		(0.0875)
Economic and Political Controls	Yes	Yes
Inverse Mills Ratio		-3.576***
		(0.0153)
Constant		0.0543
		(0.168)
Observations	165,603	165,603
Pseudo R2	0.1934	
R-squared		0.735

Robust Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1