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Abstract

In 2001, the city of Oporto was designated as the European Capital of Culture, leading to numerous cultural activities accompanied by substantial investments in urban redevelopment and new infrastructure construction. The Casa da Música (Concert Hall) and the landscape which resulted the Cordoaria reconstructed district were the case studies.

The contingent valuation method, a survey-based approach, has been used to elicit consumer preferences for cultural goods. The research conducted has employed a wide range of methods. Nevertheless, the questionnaire design, aimed at correcting various biases, are a work in progress in scientific literature. Few studies addressing these issues have been conducted in Portugal. The specific objectives are threefold: i) application of experimental and behavioural economics to analyse biases in eliciting the value of cultural activities; ii) development of a consumer preference model; and iii) examination of the coherence between preferences elicited on an ordinal and cardinal scale.

The collected information, from primary sources, was econometrically analysed using logistic, ordered logistic, generalized ordered logistic, interval regression and ordered probit models. The choice of the model was influenced by the collected data, the characteristics of the models that could fit the data, and the results of model validation tests.

In each of the independent studies, more than half of the respondents expressed a positive willingness to pay, regardless of the study domain. Concerning the performing arts, the utility derived from consumption decreased after pandemic time. Then, public intervention should invest in educational services, a field where individuals show great support to public funding, and in the digitalization process to include more audience, engaging consumers where presential fruition is disrupted. The willingness to pay for a landscape depends on education level, gender, income, ideology, and importance attributed to environmental preservation.

Key words

Contingent valuation method, cultural economics, cultural value and stated preferences

Sumário

A cidade do Porto foi, em 2001, Capital Europeia da Cultura, tendo sido o embrião de várias atividades culturais acompanhadas por um forte investimento na requalificação urbana e construção de novas infraestruturas. A Casa da Música e a paisagem resultante da requalificação da Cordoaria são os objetos desta tese.

O método de valoração contingente, uma metodologia baseada em inquéritos, tem servido para eliciar preferências declaradas do consumidor relativamente a bens culturais. A investigação que tem vindo a ser desenvolvida utiliza métodos muito diversificados. Ainda assim, a correção do enviesamento através do desenho do questionário para instituições culturais apresenta lacunas na literatura científica, sendo que em Portugal raramente foram desenvolvidos estudos para este objeto. Existem três objetivos específicos: i) desenvolvimento de um modelo de preferências do consumidor; ii) aplicação da economia experimental e comportamental na análise da presença de enviesamentos na eliciação do valor de atividades culturais; e, iii) analisar a coerência entre as preferências eliciadas numa escala ordinal e cardinal.

A informação recolhida, através de fonte primária, foi analisada econometricamente através de modelos logístico, logístico ordenado, logístico ordenado generalizado, regressão de intervalo e probabilístico ordenado. A escolha do modelo dependeu dos dados recolhidos, das características dos modelos que se podem ajustar a esses dados e do resultado dos testes de validação do modelo.

Mais de metade dos inquiridos manifesta uma disponibilidade a pagar positiva em cada um dos estudos independentemente do seu domínio. No caso das artes performativas, conclui-se que a utilidade derivada do consumo diminuiu após a pandemia. O financiamento público deve assegurar o investimento nos programas do serviço educativo, área onde os indivíduos evidenciam grande apoio ao financiamento público, e no processo de digitalização para alargar públicos, envolvendo consumidores cuja fruição física está desatualizada face aos seus padrões de consumo habituais. Por sua vez, no que diz respeito à paisagem, a disponibilidade a pagar depende do nível de educação, do género, do rendimento, da ideologia e da importância atribuída à preservação ambiental.

Palavras-chave

Economia da cultura, preferências declaradas, método de valoração contingente e valor da cultura

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Abbreviations

AIC	Akaike information criterion
BIC	Bayes information criterion
DBDC	Double Bounded Dichotomous Choice
CVM	Contingent Valuation Method
GOL	Generalized Ordered Logit
MBDC	Multiple Bounded Discrete Choice
WTP	Willingness to Pay
WTA	Willingness to Accept

Chapter 1
Introduction

Consumer preferences are one of the main topics of study in microeconomics. We can define the individual consumer as a set of preferences. These preferences are dependent of many factors like education or individual tastes which are measured in terms of the level of satisfaction obtained from consuming various combinations or bundles of goods. Then, the consumer's objective is to choose the bundle of goods which provides the greatest level of satisfaction such that they are constrained in their choices by factors like income or price (Varian, 1992; Mas-Colell *et al.*, 1995).

The consumer theory suggests that individuals derive satisfaction from consuming two types of goods: consumption and leisure. Considering the individual budget constraint, consumer preferences are a set of optimal choices that result from utility function maximization (Mas-Colell *et al.*, 1995). In the field of cultural activities and art goods, the formation of consumer preferences is influenced by the characteristic of learning-by-consuming, whose consumers accumulate experiences, and each new experience provides a different marginal utility than the previous one (Brito & Barros, 2005; Alderighi & Lorenzini, 2012).

As consumers decide in a choice, the decision-making is a core issue of consumer behaviour research. In this traditional approach, consumer behaviour depends on consumer preferences, individual income, and the goods and prices available (Brennan *et al.,* 2014). From the perspective of behavioural economics, individuals often do not process information in an analytical way, as assumed by classic theory, and the drivers of consumer preferences are the individuals' traditions, experiences, judgements, and heuristics (Brown, 2003). This theory emphasizes the limitation of rationality, assuming that, among other factors, other consumers' behaviour and emotional factors are not irrelevant elements in the process, as well as intrinsic factors (Shiller, 2005).

The satisfaction that a consumer derives from the consumption of a good is defined as utility whose measure allows the consumer to rank these bundles of goods according to the utility that they give. If the market prices are observable, they are usually an adequate reference for the value. Although,

market imperfections distort their real prices or values, for one hand; and some markets are undefined or do not exist at all, so the value cannot be readily observed (Mas-Colell *et al.*, 1995; Snowball, 2008).

One of the major challenges faced by the cultural sector is justifying its value. While the provision of cultural goods/services involves monetary costs, the benefits generated by cultural activities are not always directly expressed in monetary units. The concept of value, from the consumers' perspective, involves a willingness to pay for a service or a good, considering consumer preferences and the utility derived from each consumed unit, but also includes the cost of the best alternative regarding resource use—the opportunity cost (Throsby, 2001; O'Brien, 2010).

Revealed and stated preference methods are two separate ways of eliciting consumer preferences and they differ primarily from collected data (Mas-Colell *et al.*, 1995; Snowball, 2008). The first one counts on actual behaviour in existing markets. The stated preference methods estimate the value of goods and services not commonly traded in existing markets by creating hypothetical situations in which agents make decisions. Stated preference techniques are criticised as being unreliable because hypothetical context leads to biases and errors in the estimates but if it applied carefully, they produce valid and reliable results (Arrow *et al.*, 1993).

Eliciting the value that consumers attribute to non-market traded goods or services, such as many cultural goods and services, can resort to the application of non-market methodologies such as the contingent valuation method (Tohmo, 2004) and discrete choice method (Lourenço-Gomes *et al.,* 2014). These methods enable the creation of a virtual market, where it is possible to assess individuals' willingness to pay for cultural services (directly or through taxes). It is possible to elicit the value of goods or services without a defined market or, if it exists, they are difficult to monetize, using these methods. According to the literature, it is possible to estimate statistical bias functions and use them to correct hypothetical biases (Blackburn *et al.*, 1994; Botelho & Pinto, 2002). Estimation and elicitation of hypothetical biases are based on the application of experimental economics.

In this study, we explore the elicitation of consumer preferences for cultural services. The elicitation of preferences was conducted using the contingent valuation method (CVM), assuming that preferences are stable and well-defined. The CVM has a long tradition in the field of cultural and environmental economics, nonetheless, its validity depends on controlling hypothetical biases, sometimes observed (Thompson *et al.*, 2002; Tohmo, 2004; Lampi & Orth, 2009). In this method,

a hypothetical market is created to elicit Hicksian welfare measures, resulting in the willingness to pay or receive compensation (Mitchell & Carson, 1989; Snowball, 2008). Given a natural limit to the value of willingness to pay (WTP), determined by the financial ability to pay, the latter tends to be preferred (Hoehn & Randall, 1987; Kahneman *et al.*, 1990).

These studies also support decision-making in terms of public choice because it depends on consumer WTP and voter preferences (Heilbrun & Gray, 2001). The state (national government or local authorities) plays a significant role in financing and regulating the market (Johnson & Thomas, 1998) and promoting greater efficiency in resource allocation through the correction of market failure, namely equity access to goods and services (Heilbrun & Gray, 2001). Funding for cultural activities comes from donations, current revenues, subsidies, sponsorships, or friends' associations (Trupiano, 2005). However, because of the external benefits of these goods and services, the public administrations assume the provision directly or financing private institutions (Towse, 2010).

The European Capital of Culture is an European Commission event which pretends to highlight the cultural diversity of member-states, promote unity among people, increase the tolerance for the unknown, enhance people's access to cultural goods and services, celebrate European identity, revitalize cities' heritage (both material and immaterial), promote cultural habits, and invest in territories' image and communicate from a tourist perspective. Created in 1980, driven by the spirit of economic integration, the European Capital of Culture had a legacy measured in social, economic, and cultural terms (Srakar & Vecco, 2017). Socially, through residents' pride in the event and their involvement; economically, through increased demand and expenditure due to tourism growth; and culturally, through the creation of cooperation programs between different organizations, particularly cultural, and people's access to cultural goods and services (Garcia & Cox, 2013).

This study includes three papers, each in an autonomous chapter, but all of them with an object related to this international event that, in 2001, took place in the city of Oporto. This cultural event provided the economic, social, and political framework to create a new cultural facility, the Casa da Música (Concert Hall), which ensured conditions for regular concerts by resident musical groups, non-regular agenda over concert venue rentals, and an educational service. Additionally, a set of five urban requalification projects were developed to promote housing; enhance commerce, proximity facilities, and services; reorganize car circulation; and create a public transport network

adapted to the city downtown. The Cordoaria district, one of the five projects, was the subject of the other essays.

This chapter aims to introduce the three essays, beginning with a theoretical and conceptual framework underlying the CVM. This includes defining the concepts of culture, value, and consumer preference formation, as well as a review of recent literature concerning this methodology. The chapter continues with the definition of objectives, a presentation of the methodology, and concludes with a summary overview of the three papers.

1. Theoretical framework

Consumer theory assumes that individuals choose to consume a specific quantity of goods or services by maximizing the satisfaction that derives from the consumption, considering their individual tastes, preferences, and a set of constraints limiting their choices (Varian, 1992; Mas-Collel *et al.*, 1996). Therefore, individuals decide on the consumption of a certain quantity of goods or services based on the utility they obtain from that consumption, considering the supply conditions of those goods and services and their individual characteristics. This choice between consumption alternatives and satisfaction is achieved through the maximization of the utility function, which measures the level of satisfaction the consumer derives from each consumption of goods or services.

Preferences can be revealed or stated. Revealed preferences are formed by the observed consumer's behaviour, while stated preferences are declared by the consumer (Lamp & Orth, 2009; Lourenço-Gomes *et al.*, 2014). Stated preferences can take two distinct typologies: cardinal or ordinal. Cardinal theory considers utility measurable, with information on the intensity of consumer preferences, while ordinal theory considers it is not measurable in monetary terms but ordered in a ratio scale (Varian, 1992; Mas-Collel *et al.*, 1996).

A critical factor in stated preference methods is the risk of individuals who do not show consumption behaviour in real life that is consistent with what they say in hypothetical circumstances. On one hand, there is a more altruistic relationship with behaviour funding since it is not real (Carson *et al.*, 1992; Botelho & Pinto, 2002). On the other hand, the origin of hypothetical bias may also be related to the lack of information about the evaluated good or service (Arrow *et al.*, 1993).

Stated preference methods are widely used in cultural economics, particularly to determine the value of goods and services and elicit WTP for the enjoyment or access to these goods and services (Heilbrun & Gray, 2001; Nooman, 2003; Throsby, 2003; Towse, 2010). This is because, on one hand, many cultural goods and services do not trade in the real market – either due to public intervention in the provision of these goods, ensuring prices that do not result from free market supply and demand interactions (Trupiano, 2005; Snowball, 2005; Jaffry & Apostolakis, 2011). On the other hand, it is considered that there is value not associated with the direct enjoyment of the good (Salazar & Marques, 2005; Herrero *et al.*, 2012; Tuan & Navrud, 2008; Báez *et al.*, 2012).

The scientific research found several procedures to minimize bias from survey design to econometrical models (Snowball, 2008; Bedate *et al.*, 2009). The purpose of this section of the chapter is to explore the empirical evidence related to consumer preference formation, introducing the concepts and valuation methods into cultural economics research.

1.1. The value of culture

The scope of the concept of culture recommends an initial discussion about this notion. Culture is understood as the attribution of symbols and meanings, which can vary widely (Throsby, 2001; Doyle, 2010). The concept of culture can be interpreted as an expression of cultural identity.

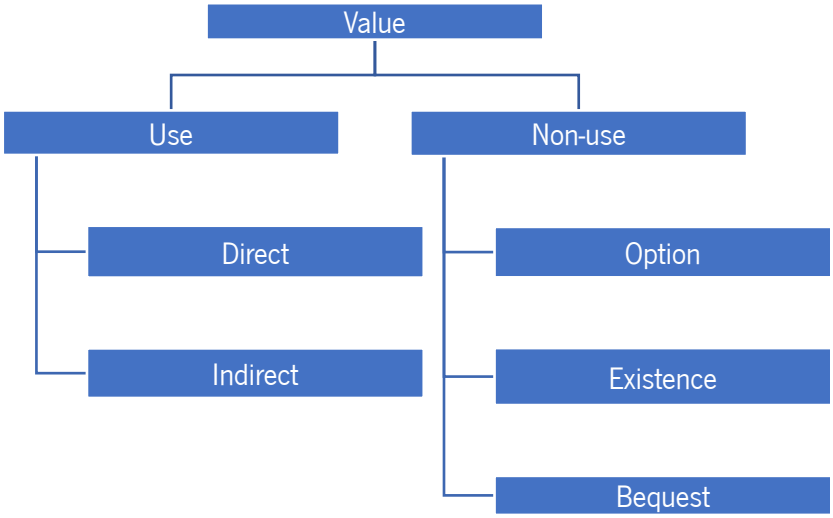
There are several characteristics present in the field of cultural economics. Firstly, economic activities are predominantly regarded as services, measuring production is more challenging than in the case of goods (Heilbrun and Gray, 2002). It is difficult to determine the quality of what is produced, which can be highly subjective, and volatile based on individual preferences compared to the production of other economic activities (Brito & Barros, 2005). Consequently, cultural services and goods exhibit the characteristics of learning-by-consuming (Alderighi & Lorenzini, 2012). Many cultural institutions belong to the public sector, and even when they do not, they often operate as non-profit organizations (Throsby, 2001; Brooks, 2006). A common factor in these activities is the tendency for fixed costs to be high, either due to the value of assets (Frey, 2003) or the rising cost of labour (Brooks, 2006). However, technology-intensive areas such as cultural industries can achieve more significant productivity gains than other domains (Fazioli & Filipini, 1997). The management of cultural organizations and institutions is similar, although cultural industries have concerns that are more standardizable in the context of the market economy (Towse, 2010). Therefore, heritage and cultural institutions (such as museums, libraries, or

monuments), fine arts and performing arts (opera, dance, or theatre), as well as cultural activities (media, cinema, or music), are considered integral parts of this economic specialization (Throsby, 2003; Towse, 2010).

The concept of value is based on the WTP for a service or a good based on consumer preferences and the utility derived from each consumed unit. It also includes the cost of the best alternative regarding resource usage - the opportunity cost (Throsby, 2001; O'Brien, 2010).

According to neoclassical theory, in the presence of a market, decision-makers determine the optimal solution through rational choice that maximizes well-being. This implies that considering budget constraints and market conditions, the economic value increases when WTP for a benefit or willingness to accept (WTA) compensation for a dropped benefit (Becker & Murphy, 1988; Chuan-Zhong & Matsson 1995).

Figure 1. Type of value



Source: Snowball (2008)

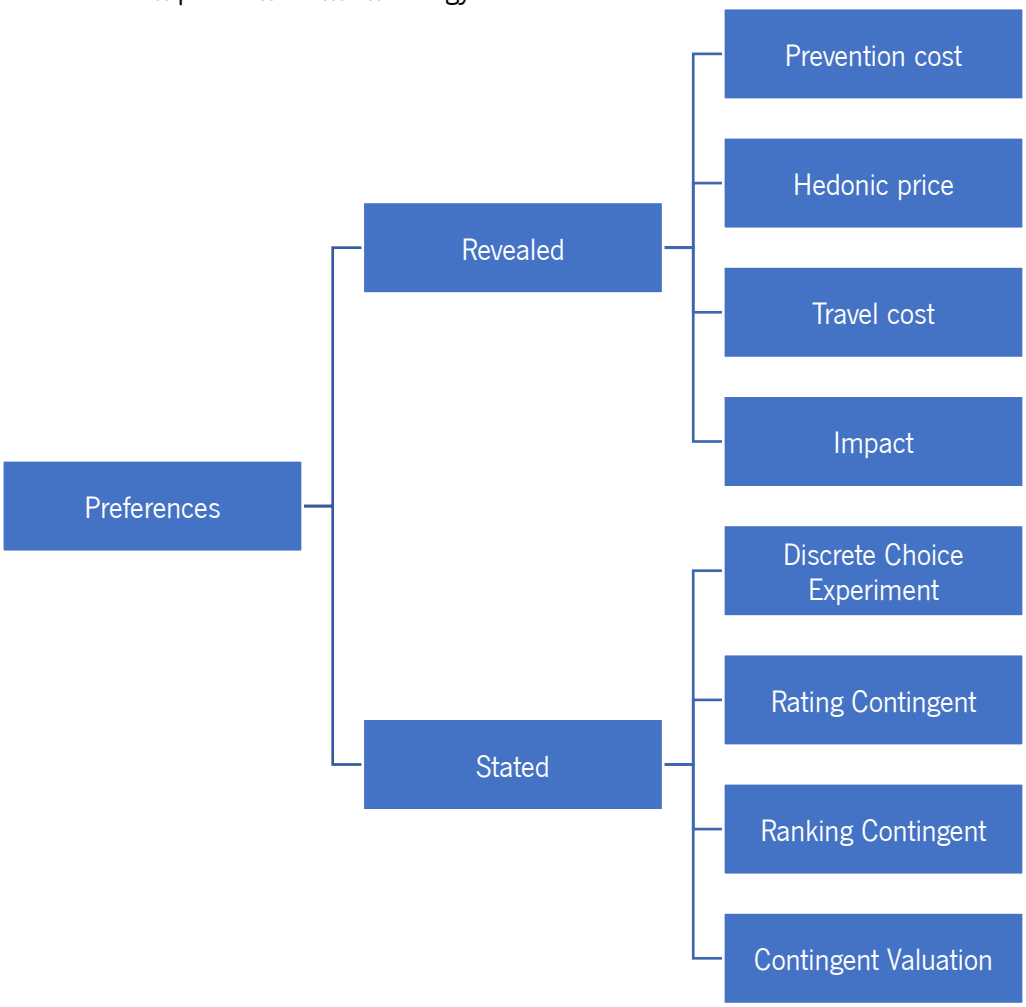
Economic analysis has shown that cultural goods and services are provided in a non-market situation, but this does not mean they do not have value. Cultural goods and services experience two types of value: use value and non-use value (Salazar & Marques, 2005; Bedate *et al.*, 2009; Andersson & Lundberg, 2013). The use value is derived from the wealth and employment generated by their existence, including the value generated by the tourism industry, indirect value,

as well as the utility generated by consumers from the direct use of these goods and services (Kin *et al.*, 2007; Mazadiego *et al.*, 2019). Snowball (2008) points out that non-use value involves the value attributed to the existence of the good or service. This means that the mere existence of the good or service provides satisfaction to individuals (pride in their heritage, legacy, or history); WTP for the option to use a resource in the future (option value); and the value of knowing that the asset has been safeguarded or protected for the benefit and use of future generations (legacy value). Figure 1 summarises the types of values that we previously examined.

1.2. Revealed and stated preferences

Revealed preferences and stated preferences are two distinct techniques for eliciting consumer preferences (Varian, 1992; Mas-Colell *et al.*, 1996). In the case of revealed preferences, elicitation is determined indirectly based on markets where demand is affected by the specific good or service. The use of methods such as hedonic pricing, impact assessment, prevention costs, and travel costs can be utilized. The hedonic pricing method identifies the implicit price of each attribute of the good or service. However, it is not appropriate because it is not common that cultural characteristics are decisive in consumers' choices for non-cultural goods or services, and it fails to capture non-use value (Snowball, 2008). Moreover, the economic impact method is appropriate for measuring the value of cultural goods or services when the level of information in the market is sufficient to elicit preferences and make decisions. It captures demand and supply shocks in regional economies by determining the additional impact of a specific economic activity in a particular area (Throsby, 2003). In the field of cultural economics, this method has been applied to measure the value of cultural events, such as exhibitions or festivals (Srakan & Vecco, 2017). However, it is often used to measure the net impact of a particular institution in a well-defined geographical area (Snowball, 2008). The consistency of this method in valuing goods and services in a market depends on its assumptions and the size of the multipliers (Andersson & Lundberg, 2013). The travel cost method defines the cost of traveling to a particular location. Like the hedonic pricing method, it fails to capture non-use value, making it inappropriate for eliciting preferences for the consumption of cultural goods and services (Ambrecht, 2014). The prevention costs method analyses expenses on acquiring goods and services for risk prevention, indicating the implicit value of the studied good. However, it is not appropriate for this non-market context (O'Brien, 2010). Figure 2 presents the most common methodologies to elicit individual consumer preferences.

Figure 2. Elicitation preferences methodology



Source: Snowball (2008)

In recent years, a couple of valuation methods have been applied for non-market situations (Thompson *et al.*, 2002; Ambrecht, 2014). Stated preference methods, such as contingent valuation or choice experiments, estimate the value of goods and services not regularly traded in existing markets by creating a hypothetical market scenario (Tohmo, 2014). In the discrete choice experiment method, surveys pressure individuals to choose their preferred option (or simultaneous alternatives) characterized by a set of attributes among different options (Botelho & Pinto, 2012). In contrast, in the CVM, whose utilization is more common than the former, individuals need to state their WTP (or willingness to forgo receiving) for a hypothetical consumption of goods or services (Towse, 2010).

The main advantage of the discrete choice method is that it allows estimating the value for multiple attributes of a good or service simultaneously (Lehtonen *et al.*, 2003; Bateman *et al.*, 2001). In this stated preference method, respondents evaluate the relative importance of attributes of goods and services to maximize their utility based on the alternatives that are considered. Individuals maximize their utility through the well-being offered by its attributes (the satisfaction comes from characteristics of the good or service and not from the consumption), choosing the attribute(s) that offer the highest level of utility (Botelho & Pinto, 2012; Lourenço-Gomes *et al.*, 2012). Although the discrete choice method identifies preferences based on attributes, the CVM is more appropriate for capturing the (total) value assigned to the good or service (Wright & Eppink, 2016). It means that provides an estimate of both the intangible utility (non-use value) and a monetary quantification (use value), where utility is derived from direct or indirect consumption of the good or service (Andersson & Lundberg, 2012; Báez *et al.*, 2012; Munley, 2018).

Ordinal preference scales were initially used to introduce attributes that should be considered in subsequent cardinal scale questions, but in recent years, they have been used autonomously, in line with the growing use of discrete choice methods to elicit consumer preferences (Chuan-Zhong & Mattson, 1995; Grigoroudisa *et al.*, 2020).

Once there are possible biases introduced by the hypothetical context assumption, these stated preference techniques must be applied carefully to produce reliable and valid results (Arrow *et al.*, 1993; Lampi & Orth, 2009). Some authors have expressed concerns about the limits of rational choice in stated preference methods since respondents are answering in a situation where information, even if well-explained, must be assimilated. As the level of information increases, the quality of the questionnaire improves. As complexity increases, there is a risk that individual responses may reflect fatigue with the exercise and, in extreme cases, yield results inconsistent with economic theory (Mitchell & Carson, 1989; Angelini & Castellani, 2019). Among the main criticisms of this method is the risk of respondents valuing a specific set of attributes more while ignoring others due to respondents' simplification of information processing, which requires approaches to achieve theoretical validation of classical consumer behaviour either through additional questions or correction instruments, but these approaches can also introduce biases (Ajzen *et al.*, 1996; Bedate *et al.*, 2009). Alternatively, the contingent ranking method asks respondents to select attributes from the most preferred to the least preferred, and contingent rating presents scenarios that respondents must evaluate on an ordinal scale (Snowball, 2008).

1.3. Contingent Valuation Method

The studies conducted to value consumer preference using the CVM have been varied in methods, applications, and outcomes. Since its initial implementation (to assess the impacts of an oil spill) following the recommendation of the National Oceanic & Atmospheric Administration (NOAA), a panel comprising prominent figures like Kenneth Arrow and Robert Solow, CVM has been widely used in environmental situations and, to a lesser extent, in cultural contexts (Arrow *et al.*, 1993; Carson *et al.*, 1992). Research in this area has included various cultural assets such as museums, theatres, cultural heritage, festivals, or public television, where willingness to pay/receive is influenced by survey design, familiarity with the good, and the created hypothetical scenario (Noonan, 2003; Wright & Eppink, 2016).

According to Hicks, consumer surplus includes equivalent variation and compensating variation. The first measures the amount of income a consumer must be provided to achieve a higher level of utility, while the latter refers to the compensation required to improve utility in the absence of the provision of a good or service (Varian, 1992; Mas-Colell *et al.*, 1996). CVM estimates the Hicksian consumer surplus through willingness to pay (WTP), which measures equivalent variation, and willingness to accept (WTA), which measures compensating variation. Typically, WTA is higher than WTP (Carson *et al.*, 1992; Aabø, 2005). This can happen because individuals may reply more cautiously to questions involving payment, or they may do so strategically. Additionally, if the substitution effect of a good is modest, individuals do not value their WTP highly (Snowball, 2008). Furthermore, WTP is constrained by the individual's income, which is less the case for WTA-related questions (Carson *et al.*, 1992). While the former technique allows consumers to choose any monetary value, minimizing bias, the latter restricts responses through referenda, iterative bidding, or payment card methods (Snowball, 2008).

Considers an individual utility function, u, as a function of market goods, x, and the quantity of service or good provided, q. Then, according to Noonan (2003), the WTP from a change between q^0 to q^1 can be traduced in the following equation:

$$WTP(q) = e(p, q^0, u) - e(p, q^1, u). \quad (1.1)$$

Consumers are asked to state their willingness to pay/receive through open-ended or dichotomous choice questions. Introducing drivers to WTP such as j sociodemographic and other intrinsic characteristics that can affect the dependent variable, the model for the individual i can be described as:

(1.2) $WTP_i = \beta_{1i} + \beta_{ji} X_j + \varepsilon_i,$

Where β_{1i} and β_{ji} are the regression coefficients, the first one is a constant and the latter is associated to the explanatory variable, and finally a ε_i that is the error term.

Dichotomous choice questions can lead to issues related to the question's influence on respondents - yea-saying (Mwebaze & Bennett, 2012; Armbrecht, 2014; Morrison & Dowell, 2015). One way to minimize this bias is the dissonance minimizing technique, involving additional questions to express the value of the good without quantifying it (Aabø, 2005). Iterative bidding starts with a certain value until the maximum WTP is stabilized. Individuals must answer affirmatively to each bid, and the process ends when they respond negatively, recording the highest bid. Determining the initial bid is better through experimental surveys (Salazar & Marques, 2005; Duttaa *et al.*, 2010; Báez, 2012; Mwebaze and Bennett, 2012). Finally, the referendum method is subject to various biases, including biases which are not entirely honest. Here too, the dissonance minimizing technique reduces this bias (Tuan & Navrud, 2008; Morrison & Dowell, 2015).

The payment vehicle should be realistic, neutral, and familiar to consumers, such as a tax or an entrance fee (Snowball, 2008). Although donations can yield unreliable results, this method is frequently used for cultural assets because it matches the three requirements (Sanz *et al.*, 2003; Gražulevičiūtė-Vileniškė *et al.*, 2011; Báez *et al.*, 2012). We need to be careful when using regional or local taxes as it violates the familiarity requirement (Herrero *et al.*, 2012).

The estimation method depends on the survey structure, especially the elicitation format. Logit or probit models are appropriate for dichotomous choice methods because the variable is binary. Typically, the logistic transformation model is used to explain the relationship between a dichotomous dependent variable (probability of responding "yes" to WTP or probability of a number of positive responses, for example) and one or more independent variables (sociodemographic variables, familiarity, or attitudes related to the good or service, for example). This econometric method is one of the most used in studies related to cultural goods or services (Tuan & Navrud, 2008; Revollo-Fernández, 2015), unlike probit, which is not widely used in this context (Báez *et al.*, 2012). On the other hand, the tobit model fits well to databases because WTP cannot be negative and has a minimum of zero. However, it is also not widely used (Snowball, 2005; Duttaa *et al.*, 2007; Salazar & Marques, 2005).

The validity and reliability of this method can be affected by various biases. First, since the market is hypothetical, some studies have problems of overestimation or underestimation in WTP results (Bedate *et al.*, 2009; Sharifi-Tehrani *et al.*, 2013). Hypothetical bias can be amplified when dealing with "moral goods" because individuals want to present a positive image of themselves (Johansson-Stenman & Svedsater, 2012). One way to minimize hypothetical bias is to introduce questions related to the consumer's familiarity with the good or their attitude toward it, as it is one of the main determinants of individual behaviour (Mitchell & Carson, 1989; Tuan & Navrud, 2008; Kuhfuss *et al.*, 2016). This can be done by introducing questions with binary responses, testing the individual's ability to recognize a cultural asset through an image, or reminding the consumer of their budget constraint, the existence of substitutes for the evaluated good or service, or references to the possibility of the bias itself (Sharifi-Tehrani *et al.*, 2013). Additionally, some studies offer the option to answer "don't know," serving as an indifference point between the two possibilities (Snowball, 2005; Delaney & O'Toole, 2006).

1.4. Contingent valuation method used in cultural goods and services

In recent decades, the CVM has been used to elicit consumer preferences for cultural goods and services, including museums, theatres, cultural heritage, and festivals. According to Nooman (2003), until 2003, historical sites had been the most studied subject (26), followed by arts and museums, each with ten studies. Additionally, eight studies related to television (and media), and seven studies had been done on heritage sites. Although the late 1990s marked a period of significant growth in these studies, they continued to be frequently developed in the subsequent years, as demonstrated by Nooman's meta-analysis.

Inspired by this work, an update was made on the studies done with this methodology over the last two decades (since Noonan's meta-analysis work), we updated the information based on publications available in the Scopus and Web of Knowledge scientific research database. Table 1 summarises the studies conducted since 2000, concluding that Spain is the country most representative, followed by Slovenia, Sweden, and Greece. Historical sites are the most common field of work, followed by heritage and festivals. It is important to point out that the festivals domain integrates some musical festivals, and, because of that, performative arts have been a less relevant topic of study. As we have seen, Portugal is not represented in this table because of a lack of works at CVM.

Table 1. Contingent valuation studies published by year, country, and object

Year	#	Country	#	Object	#
2001-2005	6	Spain	7	Historical sites	9
2006-2010	11	Slovenia	3	Heritage	8
2011-2015	18	Sweden	3	Festival	6
2016-2020	7	Greece	3	Museum	6
		Ireland	3	Landscape	4
		Vietnam	3	Broadcasting	3
		Chile	3	Library	3
		Others [1]	17	Others	3
	42		42		42

[1] Others: Australia, Chile, Tawain, England, Finland, India, Iran, Korea, Lebanon, Lithuania, Mexico, Norway, Scotland, South Africa and Thailand

Source: own elaboration

Table 2. Contingent valuation studies published by survey approach, elicitation method and payment vehicle

Survey approach	#	Elicitation method	#	Payment vehicle	#
Face-to-face	27	Discrete Choice	18	Donation	13
Online	7	Open-ended	11	Admission fee	12
Telephone	6	Bidding game	6	Others	17 [2]
Other	2	Payment card	4		
		Others	3		
Total	42	Total	42	Total	42

[2] Others: income tax, annual or monthly fee, land use rate, local tax, ticket for the guided walking tour and property tax

Source: own elaboration

As observed in Table 2, over the past twenty years, the most used interview method has been face-to-face (27), followed by online (7) and telephone surveys (6). Additionally, the most frequently used elicitation method is DBDC, followed by open-ended and bidding game.

The applied estimation method depends on the structure of bidding. In recent times, the most utilized econometric method has been the logit regression model, followed by bivariate probit, linear models, and tobit. Logit model is used to explain the connection between one dependent dichotomous variable (probability of "yes" to WTP or probability of a positive amount answer, for example) and one or more independent variables, such as sociodemographic, familiarity, or attitude related to good control variables (Tuan & Navrud, 2008; Revollo-Fernández, 2015). Second, the probit model also is used to explain logistic regression and assumes a normal distribution of the probability of the event (Logit assumes the log distribution). These models are not linear. Parameters are estimated through maximum likelihood estimation. Few studies used linear regression models (Andersson & Armbrecht, 2014; Giannakopoulou & Kaliampakos, 2016).

Appendices A shows the overview of this literature review.

2. Motivation and purpose

As we previously checked, although the valuation of culture is a relevant research topic, in Portugal there are few studies, particularly using the contingent valuation method. Externalities benefits not only individual who consumes the good or service but either community (external benefits) or, in their absence, the relevance of a non-market good or service that is provided by national government and local authorities, which are both important motivations to explore this topic. Then, this thesis utilizes the CVM to elicit the consumer's preferences through consumer surveys. These surveys incorporate both consumers and non-consumers of the cultural activities under study.

The primary objective of the dissertation is to demonstrate the value of cultural goods and services for consumers. To achieve this, there are three specific objectives: i) apply experimental and behavioural economics to analyse biases in eliciting the value of cultural activities; ii) analyse the coherence between preferences elicited on an ordinal scale and preferences elicited on a ratio scale (monetary value); and, iii) contribute empirically to the development of a consumer preference model applicable to decisions regarding the provision and consumption of cultural activities.

3. Case studies

By examining the elicitation and modelling of consumer preferences using experimental economics methodology, this study aims to provide validity of the CVM and analyse the robustness of estimates obtained by econometric techniques. It focuses on two flagship projects of Porto 2001 - European Capital of Culture. The first essay examines a performing arts infrastructure (Casa da Música), famous for hosting various musical genres, but above all for its resident musical groups. The second and third papers aim to elicit consumer preferences for a culturally relevant landscape: Cordoaria district. Although there is ongoing research on expressing preferences in the field of cultural heritage, such studies are less intensive when the focus is on landscapes.

The three papers developed in this dissertation are based on primary data sources. During the selection of two objects of study, two surveys were prepared to provide the necessary information for the CVM application.

The surveys began with questions regarding individuals' affinity to a set of service characteristics under evaluation, followed by the presentation of the hypothetical scenario, including its description as well as the mode of provision. They concluded with a set of socioeconomic and demographic questions.

Table 3. Field summary

Object	Field	Type	Users (2021, 2022)
Casa da Música	Performative arts	Private	Regular attendees of in-house concerts: 37,779 (2021), 76,998 (2022) Attendees of concerts in collaboration with external producers: 17,858 (2021), 52,693 (2022) Participants in educational activities: 25,708 (2021), 24,439 (2022)
Cordoaria district	Landscape	Public	2.27 million tourists (2022)

Source: own elaboration (Casa da Música Foundation, 2021, 2022; National Institute of Statistics, 2022)

During the interval of this thesis preparation, the world was shaken by a global pandemic, leading to the extraordinary decision to limit people's movement and close activities and services to control the progression of the contagion. This period, marked by turbulence in trust and volatility in decisions, started in March 2020. The return of freedom of movement, achieved in 2022 due to scientific advances and the population's vaccination uptake, provided conditions to progress with the planned work, notably enabling confidence to proceed with data collection while addressing biases in individuals' responses caused by changes in economic and social situations.

Table 4. Comparison between some statistical indicators of the population and the samples collected

Indicator		Population	Sample		
			Casa da Música Concert Hall	Cordoaria Cultural Landscape	Cordoaria Cultural Landscape (no Greater Porto)
Age	Average	45,40	36,22	27,77	26,60
Education level	%				
Basic education		55,60%	0,95%	0,36%	-
High School education		23,50%	18,01%	26,49%	27,72%
Bachelor or equivalent		19,80%	36,97%	43,60%	49,87%
Master or postgraduate			42,18%	28,83%	26,42%
Ph.D. or higher			1,42%	0,54%	-
Gender	% Male	47,60%	43,13%	60,90	63,20%
Income	Average	39238	29317	39703	40568
Marital status	% Single	43,50%	52,61%	80,54%	83,90%
Health status	Average		4.06	4,25	4.25
Ideology	Average	-	6.06	5,89	5.80
Household	Size	2,50	2.88	3.14	3.13
User	%	-	54,50%	66,31%	53,63%

Source: National Institute of Statistics (2022) for population data. Sample data was obtained during the research.

The samples achieved in both surveys have a younger and more educated population compared to the existing statistical information for the country. This information is available in each of the articles, sometimes with different treatments, but it is presented here to frame the interpretations of the results achieved. According to the latest Population Census (Censos 2021) conducted by the National Institute of Statistics (*Instituto Nacional de Estatística*) in 2021, the average age of the population was 45.40 years, and 43.50% identified as male. The samples' populations are

considerably younger, and the majority are single. The population with higher education accounted for 19.80% in 2021, a significantly lower percentage than the prevalence of this educational level in the three samples. While the landscape samples' population is predominantly identified as male and the performing arts sample is mostly female, 47.60% of the country's population is male. According to the Survey on Living Conditions in Portugal in 2021, 50% of the population rated their health as good or exceptionally good, which aligns with each of the samples. Finally, the annual income of the household samples for the landscapes is close to the data obtained through the Employment Survey (*Inquérito ao Emprego*), conducted annually by the National Institute of Statistics.

The collected data were subsequently analysed using econometric techniques to explain the factors determining WTP. This analysis aimed to determine consumer preferences for each of the services considered in this thesis.

4. Thesis structure

The initial article, presented in Chapter 2, utilizes the commonly utilized payment vehicle for access to performing arts services, namely purchasing a ticket at a certain price. This preference was elicited through a payment card. In this method, as explained earlier, individuals choose the amounts they are willing to pay from a set of values presented to them. This approach was also applied to educational services, however, the payment vehicle used was donations. Both means of payment are used by the institution in providing these services. The econometric methods applied to validate the model are interval regression and ordered probit.

This chapter aims to examine the differences between consumers' ordinal and cardinal preferences through a survey indicating the willingness to pay for concert tickets and donations for educational services. This questionnaire includes a question about preference intensity measured on an ordinal scale. Comparing ordinal and cardinal preferences contributes to the validity of non-market valuation methods in cultural economics.

Introducing the level of certainty of responses, the second article, Chapter 3, employs the double-bounded discrete choice elicitation method with the donation payment vehicle, using crowdfunding to create a fund ensuring the preservation of the cultural landscape. The econometric method for data analysis was the logistic model, as it allows programming the bid and the associated response. Chapter 4 presents the final article, which, with the same object of study, the cultural landscape

of Cordoaria, uses the multiple-bounded discrete choice method with the tourist tax as the payment vehicle. In this case, the adopted econometric methods were ordered logistic and generalized ordered logistic.

The Soares dos Reis National Museum was inaugurated in 1911 and reopened in 2001, during the European Capital of Culture. The project initially planned to study the museum domain with this case study. The museum had been closed for renovations in 2019, and only fully reopened in April 2023, much later than anticipated. The cultural facility hosted small-scale temporary exhibitions, while the reopening of the long-term exhibition did not occur. This more precarious activity, without intending to characterize the content of the programming, coupled with a pandemic period, could demonstrate consumers' preferences significantly affected by this context, not a genuine elicitation of the service offered by this museum facility, justifying its exclusion.

Table 5 summarizes the objectives and methodologies adopted in each of the papers, as well as the key variables in the consumer preference model. After each article, a conclusion is presented, reflecting on the main findings of each article and its contribution to the objectives outlined in this document.

Table 5. Overview of the thesis structure

Chapter	Title	Objectives	Key Variables	Elicitation Method	Payment vehicle	Econometric Method	Status
2	The impact of the COVID-19 pandemic on willingness to pay for cultural equipment services: the case of Casa da Música Foundation	Build a preference model incorporating ordinal variables Estimate the value consumers assign to performing arts equipment Analyse the pandemic's impact on consumer preferences	Gender Income Education Frequency of attending performing arts events Household size Presence of children in the household Aesthetic value Option value Social value Residency in Central Porto	Payment card	Price of ticket for concert access Donation for educational service funding	Interval regression Ordered probit	Presented at the International Conference on Cultural Economics (ACEI 2023)
3	How does political ideology affect willingness to pay for cultural landscape crowdfunding?	Validate the dichotomous double-bounded method, incorporating uncertainty level treatment Build a consumer preferences model for the cultural landscape	Gender Income Education Ideology Opinion on landscape and conservation	Double-bounded dichotomous choice	Single donation in euros for a crowdfunding campaign	Logit	Presented at the Young Researchers Workshop (ACEI 2023)

Chapter	Title	Objectives	Key Variables	Elicitation Method	Payment vehicle	Econometric Method	Status
4	Resources to preserve a cultural landscape: the impact of tourist tax as a payment vehicle	Validate tourist tax as a payment vehicle for eliciting preferences related to enjoying the cultural landscape Build a preference model with an ordinal dependent variable incorporating individual certainty level	Gender Age Annual gross household income Years of education Opinion on urban landscape's role in well-being and environment in the landscape	Multiple-bounded discrete choice	Tourist tax in € per person per night	Ordered logit Generalized ordered logit	Accepted for presentation at the World Conference on Cultural Studies (London, 2023)

Chapter 2

The impact of the covid-19 pandemic on willingness to pay for cultural facilities: the case study of Casa da Música Foundation

The coronavirus pandemic restricted the supply and demand for services provided by cultural facilities. The Casa da Música Foundation, known for its cultural and educational activities in the field of music, experienced a ticket sales decrease. This paper analyses the impact of the pandemic on consumer behaviour by minimizing de lack of contingent valuation studies in the cultural sector of Portugal. It focusses on empirical validation of the contingent valuation method (CVM) in determining the value of cultural activities, highlighting the changes in consumer behaviour and their WTP. Previous studies using the CVM in the performing arts market highlighted the significance of sociodemographic variables in determining WTP. However, there is inconsistency among these studies regarding the direction of these outcomes. A total of 211 valid questionnaires were collected and analysed using interval regression and ordered probit methods. Consistent with the reduced demand observed during the pandemic, the study found that WTP more for concert tickets decreased from €9.51 to €6.90. Moreover, there was a decline in the proportion of individuals expressing a WTP for cultural activities. The COVID-19 pandemic had a considerable impact on the availability and demand for cultural services provided by the Casa da Música Foundation. The findings highlight the importance of considering sociodemographic factors and the requirement for targeted strategies to mitigate the effects of shocks on the cultural economy, namely digitalization of contents and educational services.

JEL: Z1, Z11, Z18, D61

Keywords: contingent valuation, cultural consumer preferences, ordered probit model and payment card

1. Introduction

Public expenditure has received significant attention from economic agents. Since the sovereign debt crisis, when governments have been forced to make more restrictive fiscal policy decisions and the economic growth rate in developed countries declined, the voters point to the sustainability of public accounts. The effectiveness of public funding in public policies, promoting well-being from public expenditure, is a crucial issue.

These valuation studies can adopt different methodologies. In the case of goods and services traded in the market, economic impact studies allow for the elicitation of consumer preferences. However, for non-traded goods and services, studies can follow cost-benefit analysis, contingent valuation, or discrete choice methods (Throsby, 2003; Andersson *et.al.*, 2012).

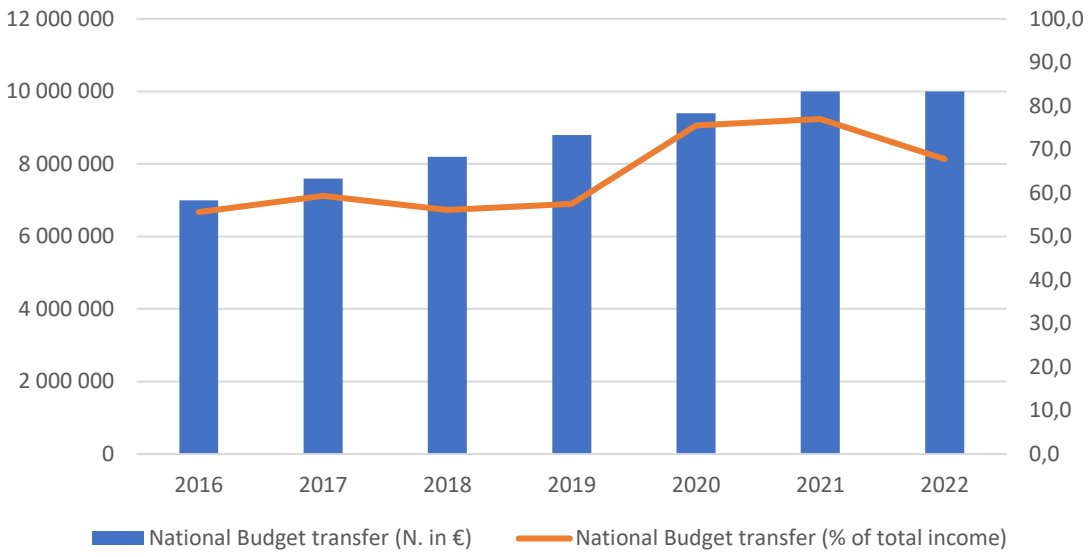
Since the 1980s, the CVM has been applied in different types of cultural goods and services, including heritage (Salazar & Marques, 2005; Kuhfussa *et al.*, 2016), museums (Bedate *et al.*, 2009; Jaffry & Apostolakis, 2011; Kuhfuss *et al.*, 2016), performing arts (Brooks, 2006; Herrero *et al.*, 2012), and libraries (Aabø, 2005; Fujiwara *et al.*, 2019). It has also been criticized. As it allows for eliciting non-use value through the creation of a hypothetical circumstance, and because individuals may provide answers that are not consistent with their real behaviour, the stated preferences may not precisely correspond to actual preferences. In some cases, results may be inconsistent with the rationality principle of economic theory. Nevertheless, there are questionnaire design techniques that control biases, and they achieve credible results, the CVM remains appropriate to value non-traded goods and services in the market, such as cultural goods (Noonan, 2003; Towse, 2010).

The existence of economic benefits from the consumption of cultural goods and services justifies their public funding (Snowball, 2005). The market failure can occur when prices are too high, which would exclude economic agents from accessing these goods, or the absence of their provision due to insufficient demand to sustain the market (Frey, 2003; Throsby, 2003). The presence of positive externalities is a reason for public investment and an intervention to assure access to the service. Public funding can be defined to cover the expenses of institutions owned by the central administration or to subsidize private institutions that promote public service, reducing the price (Frank & Bernanke, 2001; Snowball, 2008)

The pandemic caused by the Sars-Cov2 virus started at the end of 2019. The impact in Europe only began 3 months later. The contingent measures forced to restrict and close recreational and

non-essential services. Public funding was decisive to ensure institutions' financial sustainability of economic agents.

Figure 3. Funding from the Government Budget



Source: Casa da Música Foundation, 2019, 2020, 2021, 2022

In Portugal, one of the institutions supported by the Government Budget is the Casa da Música Foundation. This private institution, located in the city of Oporto (Portugal), has the purpose of promoting, fostering, disseminating, and pursuing cultural and educational activities in the field of music through a concert hall with resident musical groups and an educational service that focuses on community involvement, social integration, music education, and expanding audiences. In Figure 3, we can examine how the public funding for the Casa da Música Foundation has been increasing in recent years. In 2019, 59% of the revenue was transferred from the Government Budget to €9,040,000, and this amount increased to 77% in 2021 with a value of €10,240,000 (Casa da Música Foundation, 2019, 2020, 2021). In 2022, public funding amounted to €10,560,576, of which €10,000,000 corresponded to public grants, in a total budget of €14,739,161 (Casa da Música Foundation, 2022).

Financial sustainability was only one of the dimensions significantly affected by the COVID-19 disease because of uncertainty (Karen, 2021). The conditions under which the service is provided,

and consumer preferences changed. Furthermore, the process of organizational innovation increases. The innovation policies adopted by institutions were reactive to adapt the provision of services to the restrictions that, either through formal (law) or informal ways, affected consumer behaviour, such as schedules, access prices, and digitization of content changes (Vlassis, 2021).

The purpose of this essay is to mitigate the lack of contingent valuation essays applied to the cultural economy in Portugal, contributing to the debate on the effectiveness of cultural facilities public funding, and the empirical validation of applying experimental and behavioural economics in eliciting the value of cultural activities. The essay covers not only the concert hall service, but also other services provided by this cultural facility, particularly the educational service, which is crucial for justifying public funding due to its mission of expanding audiences. Additionally, the study analyses the coherence of preferences elicited on an ordinal scale, a dimension that has been unexplored in existing research. Finally, considering the temporal context in which it was developed, it also examines the impact that the pandemic had on consumer behaviour, resulting in anticipating solutions that minimize the impact of future shocks. In summary, the study aims to answer the following questions:

- What are the factors influencing consumer preferences in the performing arts sector?
- What value is attributed to the existence of services provided by a cultural facility?
- In what way has there been a change in cultural habits due to the COVID-19 pandemic that may have influenced the elicitation of consumer preferences and the value attributed to the cultural facility?

The essay is organized as follows: section 2 introduces the literature review, followed by a presentation of the object of the case study in section 3, and a methodological synthesis in section 4, regarding the econometric method, survey design, and database used. Section 5 provides an analysis of the theoretical validation, and Section 6 discusses the results. Section 7 concludes with the main findings and forward research.

2. Literature review

Consumer preferences can be measured in ordinal or cardinal terms. Cardinal methods are the most common, but the complexity of designing and implementing stated preference instruments has led researchers to point to an ordinal scale to analyse consumer behaviour (Grigoroudis *et al.,* 2021). Ordinal methods, whose scale of preferences does not require quantification, have gained

popularity in the past two decades. This method involves i) discrete choice, selecting alternatives based on their associated attributes; ii) ranked list, where individuals are asked to rank attributes in order of preference; and, iii) ordered categorical responses, where individuals rank a set of alternatives according to their evaluation (Snowball, 2008).

The CVM, which allows individuals to assign a value to a good or service based on a hypothetical market through questionnaires or interviews, is an appropriate procedure for eliciting stated preferences (Noonan, 2003; Throsby, 2003). Over the past few years, a couple of papers utilizing the CVM in the performing arts market have been published (Armbrecht, 2014). These works have addressed the determinants of willingness to pay or receive for services provided by performance venues or music festivals (Snowball, 2005; Andersson *et al.*, 2012; Srakar & Vecco, 2017; Andersson *et al.*, 2017).

Consumers point to distinct levels of value to such services, specifically direct use value, which refers to the direct satisfaction of consumption, and indirect use value, which corresponds to the value associated with the experience beyond direct consumption (Andersson & Lundberg, 2013). There are also non-use values (Mitchell & Carson, 1989), such as i) bequest value associated with the possibility of future generations enjoying the good or service; ii) existence value, related to the benefit derived from knowing that the good or service exists; and iii) option value, which corresponds to the satisfaction derived from the possibility of using the good or service even if it has not been done yet (Andersson *et al.*, 2012; Stevenson, 2013). These types of values attributed by economic agents to the field of arts and culture justify public intervention. Therefore, there is a favourable tendency towards public funding of such cultural facilities, particularly when services may cease to be provided without that (Andersson & Lundberg, 2013).

Although sociodemographic variables are determinants of the WTP for cultural goods and services, there is no consensus among studies regarding the direction of these effects. WTP is higher in individuals with certain characteristics, namely gender, age, household income, and education levels (Snowball, 2005; Herrero *et al.*, 2012). Women, older individuals, and respondents with more years of education tend to exhibit higher WTP (Herrero *et al.*, 2012). There is evidence that WTP for cultural goods and services is higher among groups with higher incomes (Seaman, 2005; Anderson & Armbrecht, 2014), but it is not a decisive factor when incomes are lower (Fujiwara *et al.*, 2019). Individuals show lower WTP when they do not directly use cultural goods or services, but the existence of non-use value leads individuals with lower incomes to derive satisfaction from

the existence of the good or service due to the perceived economic benefits, such as employment, tourism, income, and the possibility of experiencing direct satisfaction from consumption in the future (Snowball, 2005; Herrero *et al.*, 2012; Kuhfussa *et al.*, 2016). The club good characteristics have a positive impact on WTP because of the sense of identity and membership about the consumption of a particular cultural good or service (Anderson & Armbrecht, 2014).

The preference elicitation methods used in contingent valuation vary between payment card, open-ended, bidding game, and dichotomous choice (Mitchell & Carson, 1984; Noonan, 2003; O'Brien, 2010). The payment card method consists of individuals picking the WTP directly from the sample and provides more confidence in the results provided by respondents since it allows selection among credible options, avoiding the bias associated with the influence of the first bid because all options are available on the card (Kuhfuss *et al.*, 2016). The results obtained are more robust compared to other methods (Snowball, 2008).

The econometric models used in the literature studying WTP for facilities or events in the performing arts domain include the double-bounded dichotomous choice model (Andersson & Ambrecht, 2014; Srakar & Vecco, 2017), the logistic model, and the censored tobit model (Snowball, 2005).

3. The Casa da Música Foundation

The foundation, a public utility private entity, was created within the framework of the European capital of culture by Decree-Law No. 18/2006 of January 26th (Decreto-lei N.º 18/2016, de 26 de Janeiro). The Dutch architect Rem Koolhaas designed Casa da Música Foundation Concert Hall, a cultural facility exclusively dedicated to music events. This institution was created by the Portuguese Government, the Municipality of Porto, and private companies.

The Casa da Música Foundation is home of several resident groups, including the Casa da Música Symphony Orchestra, the Casa da Música Choir, the Remix Ensemble, and the Baroque Orchestra. Additionally, there is a variety of concerts from various musical genres. In 2019, the Casa da Música hosted 116 concerts as part of its regular agenda, attracting 63,404 spectators who purchased tickets at an average price of €11.75. The actual average cost per concert was €74.40. In 2020, due to the pandemic, only 71 concerts were held, with 26,689 spectators representing a decrease of 39% and 58%, respectively.

In 2020, the Casa da Música Foundation presented its regular program from January 1st to March 17th but then it had to close its doors from March 18th to May 31st due to the pandemic. From June 1st, the activities gradually returned, with controlled conditions such as no breaks, consecutive seating arrangements on a first-come first-served basis, and limited capacity. This led to an average cost per concert per spectator increase, reaching €154.20. There were also changes in the ticketing structure, with reduced prices for concert access, resulting in an average ticket price of €9.36. This decision aimed to "counter the public's resistance to attending concerts" (Casa da Música Foundation, 2020).

Regarding the Educational Service, which primarily focuses on the development of experimental workshops for all ages, in 2019, organized 992 events involving 25,666 spectators, with a cost of €270 and revenue of €104 per event. In 2020, the number of events decreased to 632, a 36.3% reduction compared to the previous year, with 6,896 spectators. The cost per event increased to €277, and the revenue decreased to €54.

The later information is in Table 6.

Table 6. Summary of Casa da Música Foundation activity (No.)

Activity	2019	2020	2021	2022
Regular self-produced concerts with revenue	116	71	92	128
Tickets sold for regular self-produced program	63404	26689	28739	51524
Regular self-produced concerts	154	79	95	166
Non-regular self-produced concerts	207	37	0	0
Concerts in partnership with external producers	151	44	52	88
Educational activities	992	632	906	848
Spectators of regular self-produced concerts	83699	35852	37779	76998
Spectators of non-regular self-produced concerts	51758	7965	0	0
Spectators of concerts in partnership with external producers	73710	15823	17858	52693
Participants in educational activities	61302	23538	25708	24439

Source: Casa da Música Foundation (2019, 2020, 2021 and 2022)

4. Methodology

4.1. Survey design

The conducted survey was organized into two parts. The first one asked to the individuals how their cultural behaviour changed with the pandemic time. The second part of the survey was the regular CVM survey with three sections. The first section is dedicated to consumer preferences, regarding the benefits that individuals derive from cultural goods and services consumption. The second section presents a set of questions about the WTP, given a hypothetical scenario, for i) attending a concert, ii) accessing educational services, and iii) attending a concert after the pandemic. The third and last section presents the demographic characteristics of the individuals, namely gender, age, income, marital status, political affiliation, self-assessment of health status, residential location, number of household members, and presence of children under the age of 16 in the household.

Using a sample, where individuals with access to the survey share it within their social network, 302 electronic questionnaires were conducted between February 2021 to 2022, with only 211 being considered valid (finished). This simple and cost-free questionnaire method was distributed to different target audiences to ensure sample diversity and representativeness.

The CVM, as mentioned, involves asking for WTP in a hypothetical scenario. To avoid hypothetical bias, the questionnaire provided relevant and clear information regarding the institution's financing, as well as its costs and revenues. Additionally, besides this information regarding service provision, the importance of consumer rationality was also emphasized, namely the multiple expenses and the budgetary constraints.

The elicitation method was the payment card where an individual selects each option whose individual is willing to pay, taking precautions to prevent biases. To measure the impact of bias caused by the current financial situation, individuals were also asked about how they would be willing to contribute to the institution's budget to ensure the maintenance of its services in the absence of public funding and therefore a completely different revenue structure. In the first scenario, given relevant information about the costs and returns per performance, individuals were asked about the elasticity of ticket price and donation for educational services. In the second scenario, they were questioned about the changes in WTP for a concert due to the new conditions under which the service is provided due to the emergence of the pandemic. The price of admission through ticket purchase and a donation for educational services are universal, credible, relevant,

and accepted payment vehicle as they are used by the Foundation, minimizing the risk of strategic bias and payment aversion.

The payment card was the elicitation method chosen, which will be more detailed in the following section, it allows individuals to respond in the hypothetical market similarly to how they would do in a real market. A test questionnaire was previously conducted to ten individuals to correct misunderstandings, then adjustments were made.

Table 7 outlines the descriptive statistics of the variables. Regarding the indicators of self-assessment of health status and ideology, common scales are used. While health is assessed on a scale of 1 to 5, with 1 being extremely poor and 5 being exceptionally good, according to the "Income and Living Conditions Yearbook" by the National Institute of Statistics, the evaluation of voters' ideological orientation uses a left-right barometer where 1 represents right-wing and 10 represents left-wing.

Table 7. Summary

Variable	Description	Statistics			
		Mean	Standard-deviation	Minimum	Maximum
WTP, in euros, for a concert ticket		9,51	10,65	0	30
Willingness to donate, in euros, for educational services		6,84	8,70	0	30
WTP, in euros, for a concert ticket (post-Covid-19 pandemic)		6,90	9,24	0	30
Gender	1 = Male 0 = Female	0,43	0,50	0	1
Age	Numerical variable	36,22	12,22	18	75
Marital status	1 = Single 2 = Other marital status	0,52	0,50	0	1
Household composition	Numerical variable	2,88	1,34	0	9
Income	Annual gross income of the household in euros	29317,46	22966,33	0	196000
Education level	1 = Up to the 2nd cycle of basic education (at least 6 years of schooling) 2 = Completed 3rd cycle of basic education (9 years of schooling) 3 = Completed high school education (12 years of schooling) 4 = bachelor's degree (15 years of schooling)	4,24	0,83	1	6

Variable	Description	Statistics			
		Mean	Standard-deviation	Minimum	Maximum
	5 = Master's or post-graduate degree (17 years of schooling)				
	6 = Ph.D. or post-doctorate degree (20 years of schooling)				
Children	1, if the household has at least one person under the age of 15	1,72	0,45	1	2
Health status	Ordinal scale from one to five, where one represents very weak	4,06	0,69	2	5
	and five represents exceptionally good				
Greater Porto	1, if residents of Porto, Matosinhos, Maia, Gaia, Gondomar,	0,55	0,50	0	1
	and Valongo				
Attendance of performing arts	1, at least three times	0,83	0,38	0	1
Legacy value	Rating of each attribute's value on an ordinal scale, with 1	4,13	1,86	1	7
Social value	being the most valued and 7 being the least valued	3,95	2,05	1	7
Existential value		3,94	2,30	1	7
Aesthetic value		3,76	2,12	1	7
Touristic value		4,04	1,84	1	7
Option value		4,18	1,94	1	7
Sense of belonging value		3,99	1,86	1	7

Source: own elaboration

Most of the sample is composed by females (57%), unmarried individuals (53%), young adults (average age of 36 years), with income above 24,000 euros (53%), higher education level (62%), good health (56%), and from the Porto region (62%). Compared to national statistical data, this sample is relatively younger, with better health levels, and higher qualifications. According to the latest Population Census conducted by the National Institute of Statistics in 2021, 52% of the population was female, the majority were between the ages of 25 and 64, and only 18% had completed higher education. According to the Survey on Living Conditions in Portugal in 2021, 50% of the population rated their health as good or exceptionally good.

Table 8. Justifications for null responses willingness to accept pay

Question	Options	Frequency	Percentage
Would you be willing to pay a higher price than the currently practised for a concert ticket, considering that the cost of each show, per person, on average, is 6 times higher than the ticket price at Casa da Música, considering your household income and regular expenses? [If not] Among the following options, which justification best supports your response?	I do not have any additional disposable income	32	43,24
	I consider the current price too high	24	32,43
	The government should assume this funding responsibility	15	20,27
	I do not consider it an appropriate mean of payment for accessing this service	2	2,70
	Other	1	1,35
	Total	74	100
Considering the importance of educational projects in terms of social integration, academic enrichment, and expanding	I do not have any additional disposable income	21	33,87
	I consider the current price too high	6	9,68

Question	Options	Frequency	Percentage
audiences, and the fact that their funding also comes from concert revenue, would you be willing to donate beyond the ticket price to finance the educational projects of the Foundation? [If not] Among the following options, which justification best supports your response?	The government should assume this funding responsibility	28	45,16
	I do not consider it an appropriate mean of payment for accessing this service	4	6,45
	Other	3	4,84
	Total	62	100
Considering the emergence of the pandemic, has your WTP for a concert ticket increased during this period? [If not] Among the following options, which justification best supports your response?	My disposable income has changed	29	20,42
	My consumption habits have not changed	35	24,65
	I consider the price I am willing to pay already sufficient	46	32,39
	My willingness to pay has decreased	30	21,13
	Other	2	1,41
	Total	142	100

Source: own elaboration

To understand the results and ensure their reliability, the survey presents a set of additional questions that, among other objectives, indicate the justifications for the absence of WTP. The results are in Table 8. The justifications are highly heterogeneous: while the justification for not accepting to pay more for a ticket to attend a more frequent concert is disposable income, in the case of the donation to invest in educational projects, the justification for the absence of willingness is the belief that it is the responsibility of public entities, which collect taxes to finance such projects. Furthermore, considering the period after the pandemic, the most frequent reason for not paying is simply the belief that the price they currently pay is fair enough. It is worth noting that the range

of options provided for justification seems to have been diversified and broad enough, as the number of individuals who chose other options was low.

4.2. Model specification

The study of WTP for the services provided by the Casa da Música Foundation depends on a set of variables according to the following model:

(2.1) $$WTP_i = \alpha + \beta_j X_{ij} + \varepsilon_i,$$

In this model, WTP_i is the maximum bid that an individual i manifests being or perhaps being willing to pay (where $i = 1, 2, \dots, 211$), α is a constant, X_{ij} is the observable explanatory variable j and ε_i is the error term related to unobservable characteristics that affect the individual's WTP. The vector of explanatory variables is composed of sociodemographic factors that affect the WTP, according to the literature reviewed in the previous section. The data is discrete with a common characteristic to ordered response models since the bids are naturally ordered.

With the selected elicitation method, individuals select values that they are willing to pay on a payment card with a list of bids ordered in increasing order. In addition to a simple model where the dependent variable is the selected bid, it is also possible to observe a range of values between a particular bid and the one immediately following it, where the probability of the individual pick a bid is equivalent to the probability of the true value of WTP being within that range. This value of WTP is an unobservable variable assumed to be linear and continuous, validating the least squares method and approving the interpretation of coefficients like the simple model, assuming the standard deviation of the residuals as equivalent to sigma.

By transforming the dependent variable on a ratio scale, that is, a non-random but natural order (Greene, 2012), an ordered probit model was utilized. In this case, the estimation of willingness to pay WTP_i^* is an unobservable linear variable based on X_{ij}, α, and ε_i, where ε_i is assumed to be independent and normally distributed. WTP_i^* is an unobservable latent variable, and what is observable is the bet WTP_i , which takes on a discrete ordered value. Thus, the bid WTP_i will be equal to the ordinal outcome w that falls between the limits ρ_w, according to the following equation:

(2.2) $$WTP_i = w \text{ if } \rho_{w-1} < WTP_i^* < \rho_w$$

The probability of the ordinal outcome w is given by a cumulative density function, as described in equation 3, which allows calculating the log-likelihood function by inserting these probabilities, according to equation 4.

(2.3) $$\Pr\left[WTP_i = w \middle| X_{ij}\right] = F\left(\rho_w - \alpha X_{ij}\right) - F\left(\rho_{w-1} - \alpha X_{ij}\right)$$

(2.4) $$L(WTP|\theta) = D_{iw} \Pr\left[WTP_i = w \middle| X_{ij}\right], \text{ where } D_{iw} = 1 \text{ if } WTP_i = w,$$

$D_{iw} = 0$ if $WTP_i \neq w$ and $\theta = (\alpha, \rho)$)

In this case, Table 9 summarizes the bids presented on the payment card, which correspond to 13 categories where the unobservable WTP can tend if ε_i is normally distributed.

Table 9. Categories and upper and lower limits of intervals

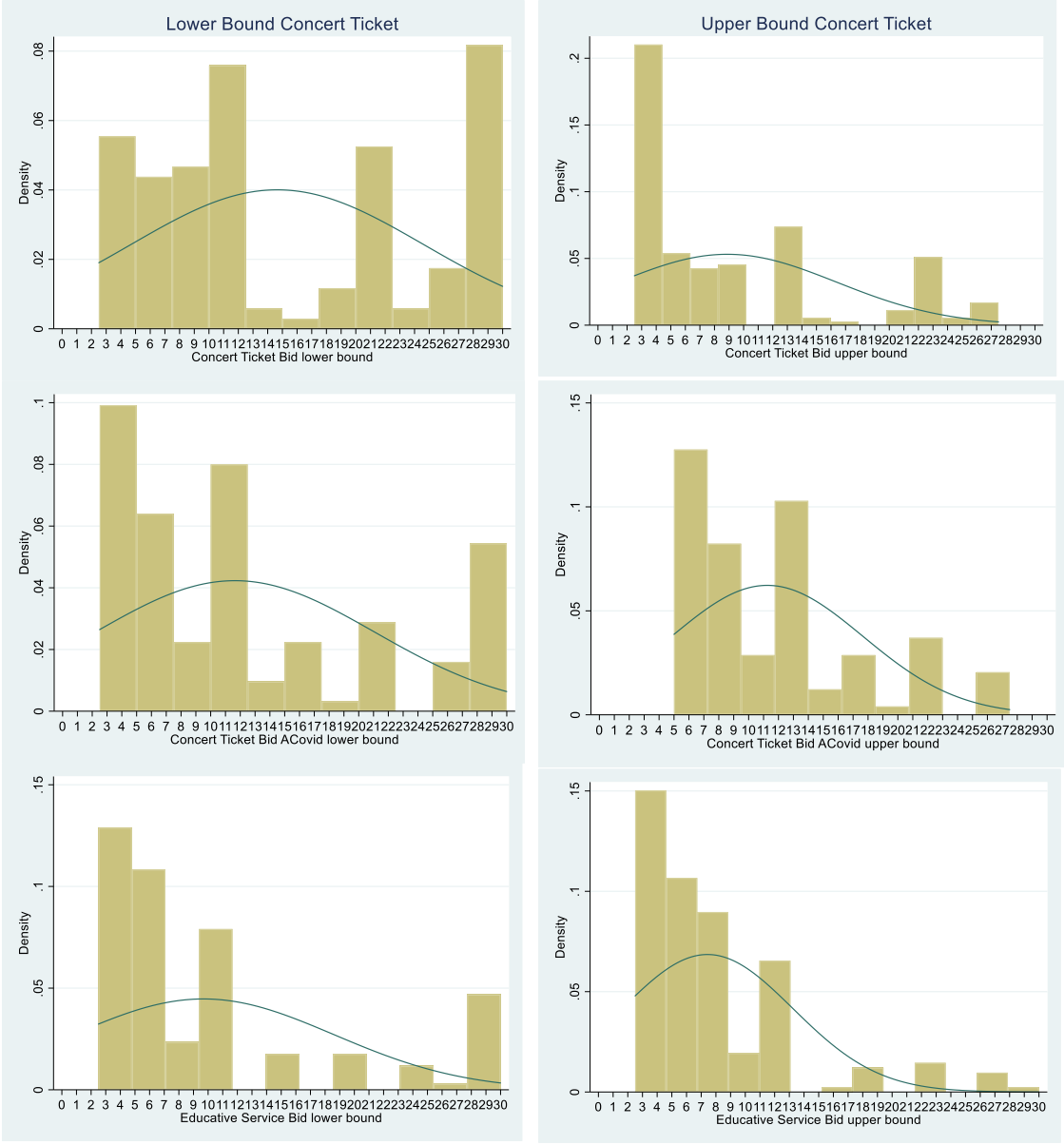
Bid	Category	Lower Limit	Upper Limit
0	1	-∞	2,5
2,5	2	2,5	5
5	3	5	7,5
7,5	4	7,5	10
10	5	10	12,5
12,5	6	12,5	15
15	7	15	17,5
17,5	8	17,5	20
20	9	20	22,5
22,5	10	22,5	25
25	11	25	27,5
27,5	12	27,5	30
30	13	30	+∞

Source: own elaboration

The ordered probit model is adjusted to the database. In addition to these thirteen categories where the unobservable WTP can tend, there are other alternatives for analysing the database, including the range between the lower and upper limits, considering the maximum bid selected or the midpoint of that range (Sajise *et al.*, 2021).

Figure 4 presents the frequency distribution for each bid class described in the previous table, representing the height of each rectangle as the frequency density of the lower limit on the right and the upper limit on the left for each bid. The histogram suggests that the distribution approximates a normal function.

Figure 4. Histograms



Source: own computation

There are at least two concerns to consider regarding the ordered probit method. Firstly, estimators obtained through maximum likelihood estimation cannot be interpreted as the causality of the independent variable on the dependent variable. It is necessary to calculate the marginal effect, which measures the effect of the discrete probability of the explanatory variable on the mean of the explained variable (Greene, 2012). Secondly, it is essential to consider the assumption that the effects on the dependent variable are constant across categories. If this assumption does not hold, there are several options, including transfer the natural ordering of the explained variable to the multinomial model. One solution is to utilize models that do not require this condition. The literature assumes that alternative models have been developed which relax this assumption while still considering the explained variable as ordered. Ordered stereotype regression and generalized ordered regression, which relaxes the parallel regression assumption for some equations, are two examples that correspond to this evolution in scientific research (Long & Freese, 2001). As it will be seen, the parallel linear assumption is not rejected, then the two models that fit the sample and the economic theory that served as the basis for their computation. The model was estimated using the Stata 15.

The dilemma between the number of observations obtained from the survey and the number of bid intervals suggests reducing the number of categories and increasing the size of each interval. However, when this exercise was performed, there was a reduction in the level of statistical significance of the regressions, impacting the robustness of the model.

5. Results

5.1. Willingness to pay

According to Table 10, the average WTP is higher among those who have used the services provided by the Casa da Música Foundation at least once in 2019. On average, users are willing to pay an additional €10.48 per ticket to attend a concert at Casa da Música. However, due to the pandemic, this WTP decreases to €7.37 on average, a decrease of €3.11. Among non-users, this difference is smaller (€2.03) on average, but in both situations, the WTP is lower compared to the non-existence of the pandemic. The measurable standard deviation is evident as the median values are €5 and €2.5, respectively.

In addition to this decrease in WTP, the number of people willing to pay also decreases, except among non-users, where the proportion of the population willing to pay a significant amount is similar. While 63.48% of individuals have a positive WTP in the absence of the pandemic, when the scenario changes, only 55.65% are willing to pay more for a ticket to a concert at Casa da Música. Interestingly, both before and after being confronted with the pandemic scenario, the proportion of positive responses regarding WTP at a higher price is higher among non-users, although the average value of this willingness is lower compared to users.

Table 10. Willingness to pay

WTP	Users				Non-users			
	Mean (€)	Median (€)	Standard deviation (€)	WTP>0 (%)	Mean (€)	Median (€)	Standard deviation (€)	WTP>0
Concert ticket	10,48	5	11,57	63,48	8,36	5	9.35	66,67
Concert ticket after a pandemic	7,37	2,5	10,18	55,65	6,33	2,5	7,97	66,54
Educational service	9,52	5	10,39	76,19	5,69	2,5	7,62	68,24
Gift/donative								

Source: own computation

Considering the educational service, there is a WTP of €9.52 for users. However, non-users WTP decreased to €5.69. The most frequent bid among individuals who consider themselves users is €5 just like the concert ticket. This bid decreases to €2.5 among non-users, which justifies a more significant difference between the two types of service users compared to the concert ticket price. It is worth to note that most individuals are willing to donate, which is 76.19% and 68.24% of the sample among users and non-users, respectively.

5.2. Driver of willingness to pay

An interval regression and an ordered probit model were used to estimate the determinants of the probability of WTP. Table 11 shows both regressions econometric results.

The interval regression model allows a straightforward interpretation of the coefficients: for a one-unit increase in the independent variable, the expected value in the dependent variable changes according to the obtained coefficient, holding everything else constant. According to this model, it can be concluded that being male increases the WTP for a ticket by an average of €5.61, *ceteris paribus*. Income also has a positive impact: at a 99% confidence level, a 10% increase in income has an average impact of €0.23, holding everything else constant. Having attended at least three concerts in 2019 increases the WTP by €6.40. Finally, the estimated regression also concludes that, holding everything else constant, the importance attributed to aesthetic value (music auditorium) and an optional value (willingness to attend a concert) has a positive relationship with the WTP for a ticket. It should be noted that individuals were asked to rank these factors in descending order, with the number 1 assigned to the most important factor and 7 to the least important factor. Therefore, the negative sign of the coefficient indicates a positive relationship between the importance recognized and the WTP, holding everything else constant. At a 5% statistical significance level, the null hypothesis that the coefficients for education and household size is zero in the model is not rejected.

Although, according to the likelihood ratio chi-square test, it can be concluded that at least one of the coefficients in the model is not equal to zero, and that the model is globally statistically significant, when compared to the ordered probit model, then the latter one fits better the data. This conclusion is based on i) a higher logarithmic likelihood value in the ordered probit model (which is not highly relevant considering that the number of variables estimated is different and there is a positive relationship between the number of variables and this indicator); ii) a likelihood ratio test that rejects the null hypothesis that both models fit the data equally well, favouring the ordered probit model; and iii) the combined analysis of the Akaike and Bayesian information criteria, which show lower values and therefore better fit for the ordered probit model. The ordered probit model assumes the parallel regression assumption. According to the Brant test, which considers the null hypothesis that there are no differences in the coefficients between each category regression, the hypothesis of proportional odds is not rejected, admitting the use of this model.

The ordered Probit model only allows us to establish the direction of the effect on the dependent variable. The probability of paying more for a concert ticket (in categories 1 to 13) varies positively based on gender (if male), income, concert attendance frequency, and the importance attributed to the aesthetic value and option value. The signs are consistent with the interval regression, but

caution is still needed as the signs may vary depending on the category. To estimate the magnitude of these effects, marginal effects must be calculated. Marginal effects measure the effect of a marginal change in the explanatory variable on the dependent variable. The results are in Table 12-14.

Table 11. Willingness to pay regression (Casa da Música Foundation)

	Ticket Concert		Ticket Concert w/ Covid19		Donation for Educational Service	
	(1)	(2)	(1)	(2)	(1)	(2)
Variables	Interval Regression	Ordered Probit	Interval Regression	Ordered Probit	Interval Regression	Ordered Probit
Gender (Male=1)	5.609**	0.340**			1.683	0.177
	(2.420)	(0.150)			(1.635)	(0.150)
Log (Income)	2.272***	0.143*	0.126	0.125	0.482	0.165**
	(0.828)	(0.0790)	(0.394)	(0.0780)	(0.545)	(0.0763)
Education (Number of years)	-0.579	-0.0366			-0.396	-0.0103
	(0.455)	(0.0323)			(0.345)	(0.0368)
Attendance of Performing Arts	6.396**	0.385**	2.110	0.206	3.259	0.366*
	(3.060)	(0.191)	(2.943)	(0.206)	(2.270)	(0.206)
Household Composition (Number of members)	-1.197	-0.0670	-0.194	0.0154		
	(0.892)	(0.0568)	(0.822)	(0.0550)		
Children in the Household					3.512*	0.253
					(1.800)	(0.164)
Aesthetic Value	-1.213**	-0.0680*				
	(0.557)	(0.0356)				
Option Value	-1.295**	-0.0716*				
	(0.657)	(0.0419)				
Social Value					0.801**	0.0747**
					(0.389)	(0.0357)
Porto			4.241*	0.280*		
			(2.255)	(0.149)		
cut 1 (ρ_1)		0.169		1.385*		1.671*
		(0.981)		(0.780)		(0.886)
cut 2 (ρ_2)		0.413		1.752**		2.243**

	Ticket Concert		Ticket Concert w/ Covid19		Donation for Educational Service	
	(1)	(2)	(1)	(2)	(1)	(2)
Variables	Interval Regression	Ordered Probit	Interval Regression	Ordered Probit	Interval Regression	Ordered Probit
		(0.981)		(0.783)		(0.887)
cut 3 (ρ_3)		0.600		2.005**		2.727***
		(0.980)		(0.780)		(0.891)
cut 4 (ρ_4)		0.801		2.099***		2.845***
		(0.976)		(0.781)		(0.893)
cut 5 (ρ_5)		1.161		2.478***		3.324***
		(0.979)		(0.784)		(0.899)
cut 6 (ρ_6)		1.191		2.532***		3.462***
		(0.979)		(0.786)		(0.900)
cut 7 (ρ_7)		1.206		2.668***		3.623***
		(0.979)		(0.782)		(0.903)
cut 8 (ρ_8)		1.269		2.689***		3.751***
		(0.979)		(0.784)		(0.905)
cut 9 (ρ_9)		1.583		2.905***		3.787***
		(0.977)		(0.791)		(0.905)
cut 10 (ρ_{10})		1.623*		3.055***		
		(0.976)		(0.788)		
cut 11 ((ρ_{11})		1.755*				
		(0.980)				
Observations	210	210	210	210	210	210
Log-likelihood	–448.876	-410.888	-426.104	-386.663	-457.070	-383.877
Chi-square	897.752	821.776	852.207	773.326	914.141	767.754
Wald test (df=7/7/0)	61.990	19.723	23.409	8.590	76.224	20.234
p-value	0.000	0.006	0.000	0.072	0.000	0.003

	Ticket Concert		Ticket Concert w/ Covid19		Donation for Educational Service	
	(1)	(2)	(1)	(2)	(1)	(2)
Variables	Interval Regression	Ordered Probit	Interval Regression	Ordered Probit	Interval Regression	Ordered Probit
AIC	913.752	857.776	801.326	862.207	928.141	797.754
BIC	940.529	918.024	848.186	878.943	951.570	847.960
Error term variance	265.711	1.000	209.037	1.000	122.133	1.000
chi2(70)		73.12		23.28		56.42
p-value		0.3758		0.6697		0.1891

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

Source: own computation

Thus, in the case of the individual being male, the probability of picking category 1 (up to €2.5) is lower by 12.3%, higher by 1.65% for category 5 (between 10 and €12.5), and 7.03% for the highest category (at least €30), holding all other variables constant. Similarly, a 1% increase in income reduces the probability of indicating category 1 by 5.23%, increases the probability of selecting category 5 by 0.74%, and increases the probability of selecting category 13 by 2.88%. Finally, a change from 0 to 1 in the variable representing concert attendance frequency before the pandemic decreases the probability of choosing category 1 by 14.7% but increases the probability of choosing category 5 by 2.44% and category 13 by 6.66%, holding all other variables constant.

The model that considers the WTP for a ticket bearing in mind the new circumstances of the pandemic, with social and economic impacts on demand and restrictions on supply, shows overall statistical significance but weak individual statistical significance of the coefficients. The exception is the location variable, which assumes the value of 1 for respondents residing in the heart of Greater Porto and therefore closer to the Concert Hall. At a 90% confidence level, residents in this region have a WTP €4.24 higher compared to others, holding everything else constant. However, as in the previous model, the ordered probit regression presents better indicators than the interval regression, although also with weak individual statistical significance. Table 13 shows the results of marginal effects. A change from 0 to 1 in the Porto variable decreases the probability of picking category 1 (WTP up to €2.5) by 11.20% at a 90% confidence level and increases the probability of choosing category 5 (between 10 and €12.5) and category 13 (over €30) by 2.31% and 4.07%, respectively. The income variable has a statistical significance at an 85% confidence level. The probability of selecting category 1 decreases by 5.21%, and the probability of selecting category 13 increases by 1.92%.

According to the likelihood ratio test and the combined analysis of the Akaike and Bayesian information criteria, the ordered probit model is the one that best fits the data, while it is not possible to reject the hypothesis that the linear relationship between the independent variables and the explained variable, meaning that the model is valid under the assumption of parallel regression, which implies that all coefficients are equal for all equations.

Regarding the educational service, the interval regression shows overall statistical significance, but only two individual coefficients pass the test of individual significance, rejecting the hypothesis that they do not explain changes in the dependent variable: i) the presence of children in the household and ii) the social value attributed to cultural facilities. Thus, the presence of children in the

household increases the WTP for a donation by an average of €3.51. As for the social value, since the scale ranges from one (most important) to seven (less important) in terms of ranking a set of values, a decrease of one unit in the relative scale of importance leads to an increase of €0.80 in the WTP, on average.

Like the previous econometric regressions, in the analysis of data related to the educational service, the ordered probit model is a better fit, while also increasing the range of variables with individual statistical significance. The coefficients are in Table 14. The individual's cultural path consumption and income are a set of variables that determine the WTP more for a donation to finance the educational service. Thus, a 1% increase in income decreases the probability of choosing category 1 by 5.62%, increases the probability of picking category 5 by 1.83% (between 10 and €12.5), and increases the probability of selecting category 13 by 1.99% (at least €30), holding all other variables constant. In turn, in the case of individuals with frequent cultural habits, particularly in performing arts, the probability of choosing category 1 (up to €2.5) decreases by 13.2%, increases by 4.11% for category 5 (between 10 and €12.5), and increases by 3.66% for category 13 (at least €30), holding all other variables constant. Except for the probability for category 13, which has a 95% confidence level, all the previous probabilities have a statistical significance level of 10%. Furthermore, the probability of choosing category 1 and 3 decreases by 2.54% and 0.34%, respectively, with a decrease in the social component's importance, but increases the probability of choosing category 5 by 0.83% and category 12 by 0.90%, respectively, holding all other variables constant.

Table 12. Marginal effects of the explanatory variables on the explained (Concert ticket)

Variables	(1) 1	(2) 2	(3) 3	(4) 4	(5) 5	(6) 6	(7) 7	(8) 8	(9) 9	(10) 10	(11) 11	(12) 13
Gender (Male=1)	-0.123**	-0.00976*	-0.00250	0.00247	0.0165**	0.00196	0.00102	0.00433	0.0245*	0.00326	0.0107*	0.0703**
	(0.0534)	(0.00553)	(0.00251)	(0.00252)	(0.00808)	(0.00165)	(0.00108)	(0.00288)	(0.0125)	(0.00257)	(0.00603)	(0.0325)
Log (Income)	-0.0523*	-0.00389	-0.000832	0.00131	0.00739	0.000856	0.000445	0.00189	0.0105*	0.00139	0.00452	0.0288*
	(0.0290)	(0.00258)	(0.00103)	(0.00123)	(0.00459)	(0.000777)	(0.000500)	(0.00143)	(0.00610)	(0.00124)	(0.00309)	(0.0163)
Education (No. Years)	0.0134	0.000996	0.000213	-0.000335	-0.00189	-0.000219	-0.000114	-0.000482	-0.00268	-0.000354	-0.00116	-0.00736
	(0.0118)	(0.000945)	(0.000299)	(0.000407)	(0.00178)	(0.000256)	(0.000149)	(0.000501)	(0.00248)	(0.000390)	(0.00108)	(0.00649)
Frequency Performing Arts	-0.147**	-0.00604*	0.00133	0.00712	0.0244*	0.00254	0.00131	0.00546	0.0287*	0.00362	0.0116	0.0666**
	(0.0740)	(0.00351)	(0.00315)	(0.00549)	(0.0147)	(0.00227)	(0.00148)	(0.00393)	(0.0161)	(0.00283)	(0.00724)	(0.0295)
Household (No. of elements)	0.0245	0.00182	0.000390	-0.000614	-0.00346	-0.000401	-0.000208	-0.000883	-0.00492	-0.000649	-0.00212	-0.0135
	(0.0208)	(0.00171)	(0.000563)	(0.000684)	(0.00306)	(0.000451)	(0.000269)	(0.000887)	(0.00423)	(0.000750)	(0.00195)	(0.0116)
Aesthetic Value	0.0249*	0.00185	0.000395	-0.000622	-0.00351*	-0.000406	-0.000211	-0.000896	-0.00499*	-0.000658	-0.00215	-0.0137*
	(0.0129)	(0.00122)	(0.000505)	(0.000548)	(0.00197)	(0.000359)	(0.000227)	(0.000654)	(0.00286)	(0.000588)	(0.00135)	(0.00757)
Option Value	0.0262*	0.00195	0.000417	-0.000656	-0.00370	-0.000428	-0.000223	-0.000944	-0.00526	-0.000694	-0.00226	-0.0144*
	(0.0153)	(0.00138)	(0.000546)	(0.000603)	(0.00230)	(0.000405)	(0.000251)	(0.000749)	(0.00330)	(0.000637)	(0.00162)	(0.00871)
Observations	210	210	210	210	210	210	210	210	210	210	210	210

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

Table 13. Marginal effects of the explanatory variables on the explained (Concert ticket with COVID-19 circumstance)

Variables	(1) 1	(2) 2	(3) 3	(4) 4	(5) 5	(6) 6	(7) 7	(8) 8	(9) 9	(10) 11	(11) 13
Log (Income)	-0.0521*	-0.00100	0.00332	0.00195	0.0107	0.00171	0.00443	0.000688	0.00679	0.00433	0.0192*
	(0.0303)	(0.00167)	(0.00234)	(0.00141)	(0.00668)	(0.00141)	(0.00308)	(0.000795)	(0.00451)	(0.00313)	(0.0115)

Variables	(1) 1	(2) 2	(3) 3	(4) 4	(5) 5	(6) 6	(7) 7	(8) 8	(9) 9	(10) 11	(11) 13
Education (years)	-0.00144	-2.76e-05	9.15e-05	5.39e-05	0.000295	4.72e-05	0.000122	1.90e-05	0.000187	0.000120	0.000530
	(0.0139)	(0.000271)	(0.000887)	(0.000523)	(0.00285)	(0.000458)	(0.00119)	(0.000185)	(0.00182)	(0.00116)	(0.00513)
Porto	-0.112*	-0.00157	0.00743	0.00428	0.0231*	0.00367	0.00948	0.00147	0.0145	0.00922	0.0407*
	(0.0587)	(0.00341)	(0.00485)	(0.00288)	(0.0131)	(0.00285)	(0.00608)	(0.00166)	(0.00889)	(0.00627)	(0.0218)
Observations	210	210	210	210	210	210	210	210	210	210	210

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

Table 14. Marginal effects of the explanatory variables on the explained (Educational service donative)

Variables	(1) 1	(2) 2	(3) 3	(4) 4	(5) 5	(6) 7	(7) 9	(8) 11	(9) 12	(10) 13
Gender (Male=1)	-0.0596	-0.0108	0.00756	0.00385	0.0194	0.00577	0.00635	0.00459	0.00121	0.0216
	(0.0507)	(0.0103)	(0.00649)	(0.00356)	(0.0170)	(0.00579)	(0.00591)	(0.00455)	(0.00149)	(0.0196)
Log (Income)	-0.0562**	-0.00979*	0.00743*	0.00368	0.0183*	0.00539	0.00591	0.00427	0.00112	0.0199*
	(0.0268)	(0.00585)	(0.00428)	(0.00228)	(0.00965)	(0.00348)	(0.00378)	(0.00285)	(0.00115)	(0.0102)
Education (Years)	0.00351	0.000612	-0.000464	-0.000230	-0.00114	-0.000337	-0.000369	-0.000266	-7.01e-05	-0.00124
	(0.0115)	(0.00202)	(0.00154)	(0.000755)	(0.00375)	(0.00111)	(0.00124)	(0.000868)	(0.000241)	(0.00403)
Frequency Performing Arts	-0.132*	-0.0125*	0.0232	0.00910	0.0411*	0.0113*	0.0121	0.00851	0.00221	0.0366**
	(0.0767)	(0.00690)	(0.0174)	(0.00638)	(0.0246)	(0.00682)	(0.00807)	(0.00606)	(0.00252)	(0.0175)
Child	-0.0830	-0.0174	0.00890	0.00517	0.0272	0.00830	0.00924	0.00676	0.00179	0.0331
	(0.0513)	(0.0131)	(0.00567)	(0.00344)	(0.0170)	(0.00630)	(0.00740)	(0.00512)	(0.00205)	(0.0242)
Social value	-0.0254**	-0.00442*	0.00336*	0.00166*	0.00826*	0.00243	0.00267*	0.00193	0.000507	0.00897**
	(0.0120)	(0.00248)	(0.00193)	(0.000947)	(0.00430)	(0.00155)	(0.00150)	(0.00141)	(0.000557)	(0.00451)
Observations	210	210	210	210	210	210	210	210	210	210

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

6. Discussion

The non-response or the proportion of null answers is a challenging issue in CVM. Therefore, it is important to start by analysing the types of justifications for the lack of WTP. In the case of concert ticket prices, over three-quarters of the individuals provide an economic justification for not being willing to pay more. Despite these economic reasons, the ideological question emerges as a crucial factor for 20.27% of the individuals who believe that the funding for such facilities should be provided by the national budget rather than incorporating the costs into ticket prices. This latter issue becomes particularly relevant when the mean of payment is a donation for educational services, where 45.16% of the non-responses are justified by assuming that the government should be responsible for financing cultural facilities. When individuals are confronted with the impact of the pandemic, economic concerns become particularly relevant, either because they believe their WTP has decreased due to different consumption alternatives or because their income has changed. Approximately one-third of the respondents consider the price to be fair and, therefore, believe that no changes should be made. The remaining options are not significant. This analysis can be concluded that zero answers are not protest responses but genuine bids. However, the individuals who justify the null answer because they defend public intervention can underestimate the value because they may consider that the good has more value but do not mention it.

Table 15. Cultural habits with the emergence of the pandemic

Cultural Practices	Lower frequency Justification		Justification				
	N	%	Supply changes	Income changes	Confidence level changes	Personal availability changes	Other
Cinema	188	89,10					
Performing arts	186	88,15					
Museums and monuments	190	90,05					
Other recreational and leisure activities	63	29,86					
One at least	205	97,16	47 (22,93)	8 (3,90)	102 (49,76)	31 (15,12)	17 (8,29)

Other justifications: 5 related to supply (closure/lack of availability), 7 related to fear of contagion (referring to the pandemic), 2 related to balancing family life, 1 related to all being justifications, and 1 related to the absence of cultural habits.

Source: own computation

Table 15 presents the justification for the lower frequency of cultural practices facing extraordinary circumstances. Considering that, at least 97.16% of the individuals reported a decrease in frequency in at least one cultural practice. However, it is important to understand that this decrease in frequency differs depending on the type of activity. While the impact of the pandemic on cultural consumption habits was 90% concerning museums and monuments, it was only 30% for other recreational and leisure activities. Further analysis seems to reveal that trust is decisive in changing consumption patterns (49.76% of those who decreased the quantity demanded for at least one service state that they did so due to a confidence damage), as well as limitations on service availability (22.93% of those who believe there has been a decrease in the frequency of at least one of the identified cultural activities).

Over half of the individuals express a positive WTP more for a ticket or donation. However, the availability to pay is higher in the absence of the pandemic circumstance. Besides the decrease in the number of economic agents willing to pay, the average value that an individual is willing to offer additionally for a concert ticket is also lower. In 2019, the average ticket price for a concert was €11.80 per concert, and this study concludes that there was a willingness to increase that price by €9.51. After the pandemic, the amount of WTP has decreased, with individuals only able to pay an average of €6.90 more to attend a concert at Casa da Música. Numerous arguments can justify the impact of the pandemic on WTP.

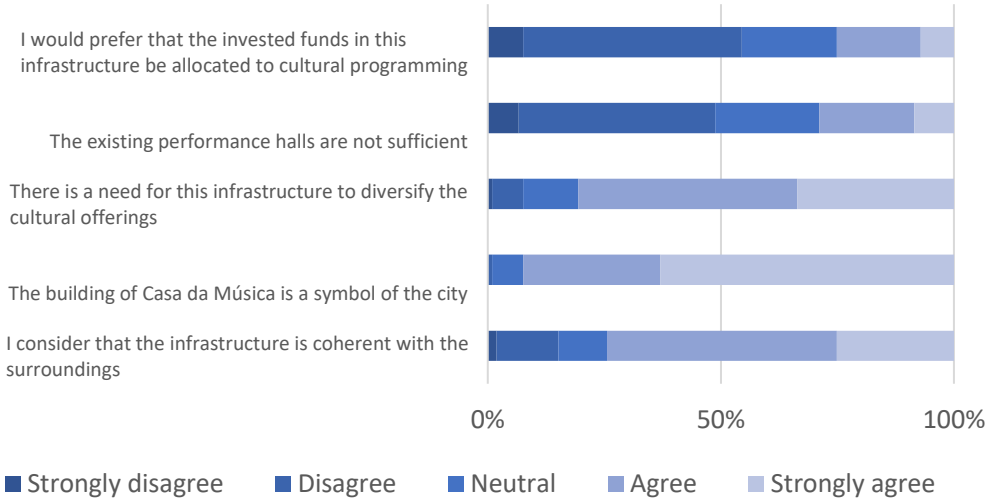
Firstly, according to the sample, customers of Casa da Música concert service are relatively older (with an average age of 40) than non-users (with an average age of 31), which may indicate greater concern regarding contagion risks. According to Mann–Whitney test, age is statistically significant when deciding whether there is (or is not) a WTP more for a ticket, although it is not a driver of economic value in our model (it is not statistically significant). Secondly, cultural goods and services have the characteristic of learning by consumption, and therefore, the absence of supply can compromise the quantity demanded at that moment, as well as it may have medium and long-term effects, such as the substitution of complementary services or goods. Furthermore, the solid public funding provided to Casa da Música, which offsets the risk of smaller funding by sponsors, restricts a set of risks associated with the reduction or even suspension of provided services, which could also alter consumer preferences.

However, even with these mitigated risks, the quantity offered has increased to this reduced willingness to consume through a decrease in the number of concerts and even a reduction in

ticket prices. In 2021, 92 concerts of in-house production were held (24 fewer than in 2019), and each concert reached an average of 312 ticketed attendees (234 fewer than in 2019). This indicates that the results obtained in this study are consistent with the historical activity of the Foundation. However, it is worth noting that safety measures, such as social distancing and the requirement for the presentation of a digital certificate proving vaccination or testing remained valid over 2021.

Finally, extrapolating from the previous analysis of justifications for zero WTP, the reduction in disposable income for households and the selection of alternative consumption options also likely contributed to these results.

Figure 5. Assessment of individuals about the attributes of Casa da Música Foundation



Source: own elaboration

Users show a higher average WTP to attend a concert, which is consistent with the literature (Snowball, 2005; Herrero *et al.*, 2012). However, the proportion of individuals who are willing to pay more is higher among non-users. Non-use value types, such as legacy and belonging, are statistically significant in showing the differences between the people who can pay more for a ticket and the people who cannot, according to the Mann–Whitney test. This conclusion is consistent with the literature regarding the valuation of economic, social, and historical attributes associated with the existence of the good or service, even if not utilized (Snowball, 2005; Kuhfussa *et al.*,

2016). According Figure 5, the Casa da Música Foundation has an overall positive image, and the cultural facility receives good ratings in the sample. It is worth noting that 92.42% of the sample consider the institution to be a symbol of the city of Porto, and 80.57% defend that the institution is essential for diversifying the cultural offerings.

According to the literature, it would be expected that determinants explaining the WTP more for a concert include gender, location, household income, and education levels (Snowball, 2005; Andersson & Armbrecht, 2014; Srakr & Vecco, 2017). The results of the econometric regressions lead to the following conclusions:

- Household income and individual qualifications: While the hypothesis that qualifications do not contribute to the model as an explanatory variable of WTP is not rejected, this study concludes that there is a positive relationship between income and WTP, which is consistent with economic theory where higher income allows economic agents to have greater price elasticity.
- Culture: There is a positive relationship between individuals who regularly consume services in the performing arts domain, as well as those who attribute intrinsic value to the resident music ensembles of the Casa da Música Foundation, and their WTP more for a concert ticket.
- Gender: Contrary to what the literature suggests, where females exhibit higher WTP (Seaman, 2005; Anderson and Armbrecht, 2014), this study finds that be men positively contribute as a determinant of the dependent variable.
- Location: It is a particularly explanatory determinant of WTP more for a concert ticket after the emergence of the pandemic. This may occur for several reasons, including the interpretation that shorter travel distances and reduced mobility decrease feelings of insecurity, as well as the mobility restrictions imposed during the infection control period.

The educational service receives higher valuation among socio-economic groups with higher incomes and a path of cultural habits. It is not surprising that when an individual has children in the household are able to elicit more from one that does not have. This variable is statistically significant. In fact, one of the justifications for cultural facilities public funding is precisely the relevance that educational services can have in the development of citizens and the importance of universal access that does not only depend on family background, income, and consumption

habits. Additionally, the relevance of historical consumer behaviour in the sample links to the fact that some cultural goods and services have the characteristic of learning-by-consuming.

The use of the ordered probit econometric method arises primarily from the transformation of bids into ordered categorical variables. Although the dependent variable can be considered continuous, the use of the payment card method and the transformation into categories in the dataset introduce conditional values. Additionally, the interpretation of coefficients in the probit ordered model may not be direct, but it can be more intuitive compared to alternative models.

A disadvantage of this dataset is the small size, which has implications for the representativeness of the population under study and the computation of econometric models. For the ordered probit model, this fact can affect the precision of the outcomes because some categories have few observations. However, reducing the number of options in the survey or subsequently in the preparation of the dataset would also increase the risk of response bias and reduce the precision of WTP estimates.

7. Conclusion

The interval regression, which assumes information of the natural ordering of responses but not the exact values, imposing upper and lower bounds on the dependent variable. Gender (male), annual income, and the frequency of attending concerts have a significant effect on increasing the willingness to pay for a concert ticket. Based on the interval regression, an ordered probit model was coded with 13 categories corresponding to the number of bid intervals from smallest to largest one. In addition to the relevance of household income, cultural background, gender, and location as determinants of WTP more for a concert ticket, one of the main conclusions of this study is the increased manifestation of unwillingness to pay more after the emergence of the pandemic. This indicates changes in demand, including changes in consumption habits or changes in available income, as well as a growing awareness of the need to use taxpayers' funds to ensure access to cultural goods and services.

This result has implications for public policy. In the face of the increasing occurrence of adverse events (such as pandemics or severe weather), funded institutions should have updated contingency plans to minimize risk. These plans should include not only security measures but also provisions for providing cultural services remotely, benefiting from the organizational

innovation acquired during the pandemic. Reactive innovation in digital content production during emergencies should lead to proactive policies that provide new services that are less dependent on real contact with musicians, utilizing augmented reality and new musical experiences for families. If something happens again, there is a demand for these types of services. Additionally, this essay also points out the importance of public funding for the financial sustainability of these institutions, particularly during the pandemic, indicating the individuals who rely on this funding to keep cultural policies alive in emergencies. Furthermore, digital content (easily disseminated in any geographic space) has an impact on removing barriers that restrict access to cultural goods and services.

This study provides directions for future research. Methodologically, it would be important to conduct a valuation study with a larger dataset and include additional explanatory variables, such as service quality characteristics and recommendation mechanisms, to obtain a more robust model explaining the determinants of WTP more. Moreover, from an economic theory perspective, after analysing the short-term effects of the pandemic on consumer preferences, it is crucial to understand whether the observed decrease in WTP for cultural services is a result of new consumption habits associated with budget constraints, altering the respective indifference curves.

Chapter 3

How does political ideology affect the individual's willingness to pay for crowdfunding to preserve a cultural landscape?

Non-market techniques are widely used to value cultural goods and services. During the European capital of culture event, the city of Oporto developed an urban requalification plan for the Cordoaria district, a cultural landscape with 18th-century buildings classified as national monuments. This study employs a double-bounded dichotomous choice (DBDC) contingent valuation survey to estimate individuals' willingness to pay (WTP) for cultural landscape with the purpose of better understand how individuals measure their cultural heritage. The role of political ideology in the WTP for a cultural good or service is a subject rarely discussed in cultural domains, contrary to what happens in the literature on environmental economics. Then, this essay aims to analyse the cultural value declared by residents in Portugal using a crowdfunding donation as the mean of payment where political affiliation is a control variable. For this purpose, given the design of a hypothetical circumstance, the individuals were asked about their WTP to a fund that would prevent a specific construction planned for that area, preserving the existing landscape. During the month of November 2022, 555 online questionnaires were collected from residents in Portugal. The results show that the individual's political ideology is a statistically significant explicative variable with a positive sign, concluding that individuals who consider themselves on the left wing are more likely to be willing to donate to the preservation of the landscape.

JEL: C91, D12 and Z10

Keywords: consumer preferences, cultural landscape, contingent valuation method and double bounded dichotomous choice,

1. Introduction

The European Union Treaty, in Article 3, clause 3, clarifies that the Union must protect and enhance Europe's cultural heritage. Each member state has autonomy in national cultural policies and the European Commission takes responsibility for more universal complementary policies that address member state´s shared challenges. For this reason, in 2014, the European Commission launched the Creative Europe program, which aimed to digitize the cultural sector, modernize the governance model of cultural institutions, and provide financial support for innovation in the creative sectors. The program supported 25 thousand artists, 2000 cinemas, 800 movies, and 4500 literary translations with a budget of €1.46 billion (European Commission, 2018).

In 2018, the European Commission launched the New Agenda for Culture, to bring citizens closer to European values and increase the level of cultural participation. The agenda includes: 1) promoting cohesion through cultural diversity, which involves funding a program of cultural activities, removing barriers to the mobility of workers, and protecting European heritage; 2) developing an innovation-intensive economy, which includes access to the arts in formal, non-formal, and lifelong learning, funding innovation and institutional skills; and 3) establishing a cooperation network to support culture as a driver of social development, promote intercultural dialogue, and establish partnerships for the preservation of cultural heritage (European Commission, 2019). As a result, the Action Plan for Cultural Heritage was developed, consisting of five pillars: 1) participation and universal accessibility; 2) defining smart solutions for sustainability; 3) protecting threatened heritage; 4) investing in knowledge and research; and 5) international cooperation. These programs had funding from Creative Europe and multiannual financial framework programs (European Commission, 2018).

In 2000, the Council of Europe established the European Landscape Convention, the first international agreement for the protection and management of landscapes, defining it as "a part of the territory, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors" (Council of Europe, 2000). Thus, there is a relationship between the economic benefits that can be derived from the landscape and its preservation (Bullock *et al.*, 2010).

Even before this initiative, the European Commission organizes, since 1985, the European Capital of Culture Initiative, with positive consequences on the sense of identity, growth of tourism, and population access to cultural goods and services (Garcia & Cox, 2013; Srakar & Vecco, 2017). In

2021, the city of Oporto (Portugal) hosted the event and, among other activities to promote access to cultural goods and services, conducted a series of regenerations of the public space. The Cordoaria district was one of the places where this intervention was implemented. The city is managed by local authorities. Then, public policies have implications in this field. Public policy decisions have implications on how citizens relate to the city, so it is important to know how citizens evaluate the cultural landscape.

Cultural ecosystem services are the non-material benefits that the individual derives from the ecosystem (Sarukhán & Whyte, 2003), namely cultural diversity, spiritual and religious components, knowledge, education, tourism (recreation), inspiration, aesthetic values, social relations, sense of territory and cultural heritage values (Cheng *et al.*, 2019). These cultural landscape benefits may affect public space distribution political decisions, requiring the measurement of this set of values (Verbič & Slabe-Erker, 2008; Rewitzer *et al.*, 2017).

Since the individual can derive utility through the preservation and enjoyment of this cultural landscape, which scientifically can assume the concept of cultural ecosystem services, the measurement of its value has consequences for decision-making from the point of view of space distribution (urban planning and urbanism) and the concept of that space (landscape architecture and public works). This means that, although there may be an intrinsic value, independent of any benefit that may be derived by individuals, what is most relevant from the decision-making point of view is the instrumental value, which concerns precisely the satisfaction that the individual derives from the consumption of this good or service.

This research aims to determine consumer preferences for a cultural landscape using crowdfunding as vehicle of payment. Crowdfunding is a voluntary donation from multiple micro-investors, being a recent way of financing (Stoknes *et al.*, 2021). As it appeared with the advent of digitalization and financial technology (fintech), it is still little explored as a payment vehicle (Kragt *et al.*, 2021;).

Although the contingent valuation method (CVM) is commonly used to elicit consumer preferences for cultural goods and services, including the landscape (Verbič & Slabe-Erker, 2008), this study differs from previous research in two essential aspects. Previous studies have focused on explaining individuals' behaviour based on attitudes and socio-demographic variables such as gender, income, and education (Del Saz-Salazar & Garcia-Menendez, 2003; Dutta *et al.*, 2007; Slabe-Erker & Klun, 2016). These factors are included in our model, but the focus is on the role that political

ideology can play in understanding consumer behaviour concerning the provision of cultural goods and services. Previous literature on other fields provides evidence that individuals who support left-wing parties are more likely to pay a positive WTP for goods and services who they know that provide public benefits (Carlsson *et al.*, 2012; Dupont & Bateman, 2012).

Our study provides further evidence on the economic value attributed to the cultural landscape using the contingent valuation with i) treatment of uncertainty, ii) use of donation as a vehicle of payment to measure WTP, and iii) selection of the first question based on a prior preference scale rather than a random choice.

To this end, we create a CVM scenario where individuals were presented with two figures. The first one represented the current scenario after urban regeneration intervention. The second was the modelled landscape. The elicitation method used was the double-bounded dichotomous choice (DBDC). The survey was conducted only to residents in Portugal, as they are most familiar with the place and its characteristics. Nevertheless, explanations of contingent scenarios designed for the survey were provided throughout the questionnaire. The decision to choose the Cordoaria district results from the high heritage value that involves the entire district, which represents a continuum of classified buildings.

The paper is organized as follows. Section 2 provides a general background on CVM applied to cultural landscapes. Section 3 describes the object of this essay and the characteristics of the cultural landscape. Section 4 presents the methodological description, and it explains how the survey design can limit the impact of the (hypothetical, strategic, and protest) biases. Section 5 presents the results derived from the data, and Section 6 the results. Section 7 describes a discussion regarding the theoretical validity of the methodology used and the main results obtained. Finally, Section 8 concludes.

2. Literature review

Beyond human, physical, and natural, capital can also be cultural, considering that it is possible to measure the cultural value component that an asset may have - tangible, when associated with a building, object, or site, or intangible, a set of beliefs or traditions (Throsby, 1999). Cultural value presents a set of attributes, such as aesthetic, social, legacy, belonging, or option (Snowball, 2008).

Landscape has been a widely studied topic across various disciplinary fields (Lovell & Johnston, 2009; Sinha & Mishra, 2015), however, these studies have mainly focussed on the analysis of benefits derived from rural landscapes (Rewitzer *et al.*, 2017; Getzner, 2019). Researchers have specifically explored the cultural dimension of these landscapes (Tengberg *et al.*, 2012; Tratalos *et al.*, 2016; Zoderer *et al.*, 2016; Blicharska *et al.*, 2017).

The landscape can be considered a public good since it has two traditional characteristics of such goods: it is non-excludable, meaning it is not possible to exclude consumption/use by another individual, and it is non-rivalrous, meaning its consumption/use does not prevent others from doing the same. Public goods are not traded in a traditional market. Therefore, analysing consumer preferences in the market, known as revealed preferences, may not be sufficient to determine the value of such goods (Varian; 2012), even considering that the price is crucial to assess well-being derived from a given good or service (Towse, 2004). To overcome this limitation, Ciriacy-Wantrup, in 1947, developed an economic technique based on the analysis of consumer behaviour in a hypothetical scenario, called the CVM, although it was only applied years later, when consumption historic is not needed (Verbič & Slabe-Erker, 2008). This method has been used to value environmental externalities, which have both use and non-use values (Throsby, 2003; Snowball, 2008). For this reason, it has also been applied to elicit consumer preferences regarding landscapes, where use value is related to the direct benefits individuals derive from its enjoyment, such as tourism or other economic activities, and non-use value refers to indirect benefits associated with the landscape, such as ecosystem preservation or aesthetic valuation (Del Saz-Salazar & Garcia-Menendez, 2003; Verbič *et al.*, 2016).

Other methods such as hedonic pricing or travel cost can also be used to determine the value of landscapes by using information indirectly related to the consumption of the good (Cheng *et al.*, 2019). The discrete choice experiment method, on the other hand, counts on valuing different attributes to measure the value of the landscape (Wright & Eppink, 2016). The methodological advantage of contingent valuation is its ability to measure the benefits not revealed through market interactions, such as non-use values. In fact, "the majority of studies [on cultural heritage] use the contingent valuation method" (Wright & Eppink, 2016), which estimates the total value of the landscape, including both use and non-use values, as well as understanding the socio-demographic characteristics of individuals who are more or less likely to explain this value. This method is appropriate for eliciting consumer preferences regarding changes in the landscape, as it allows for the calculation of the monetary value individuals assign to the landscape and the perception of the

characteristics that determine it, with practical implications for decision-making (Carson *et al.*, 2013; Getzner, 2019).

Table 16 summarizes the studies conducted since 2000 on cultural landscape field. The design of the CVM includes the elicitation method (open-response, bidding game, payment card, or dichotomous choice) and the payment vehicle (tax, fee, access price, or donation). There is a broad view of cultural landscapes ranging from agricultural (rural) landscapes to natural landscapes, although the literature review focuses only on essays that consider landscapes in urban contexts (Del Saz-Salazar & Garcia- Menendez, 2003; Verbal *et al.*, 2016) or heritage in a perspective that includes the landscape surrounding it (Dutta *et al.*, 2007; Kim *et al.*, 2007; Verbič & Slabe-Erker, 2009; Báez-Montenegro *et al.*, 2012).

While variables such as education, age, residence, and the number of household members may not be statistically significant in determining WTP for a landscape modification (Verbič & Slabe-Erker, 2009), income, the number of values which individuals consider relevant (recreational activities, preservation, heritage, or education), and visit frequency are important drivers (Verbič *et al.*, 2016).

Given the high number of studies that have been conducted, there are also several concerns about the validity of using the CVM. Among these critical points is the level of familiarity with the object of analysis and the frequency of its enjoyment (Armbrecht, 2014; Munley, 2018).

The literature concludes that one of the means of payment used in the landscape context is a donation to a fund (Del Saz-Salazar and Garcia-Menendez, 2003; Báez-Montenegro *et al.*, 2012). Moreover, previous literature determines that variables related to education, familiarity with cultural activities, and accessibility increase the probability of donating more; however, it also concludes that gender, nationality, political position, and housing size are not statistically significant determinants (Ateca-Amestoy & Gorostiaga, 2022).

Table 16. Overview of literature

Object (location)	Methodology (elicitation method, payment vehicle, econometric model, sample size, and questionnaire technique)	Determinants	Reference
Requalification of the Castellón Port Area (Spain)	Dichotomous choice, donation to a fund, logistic model, 562 face-to-face questionnaires	Income (+), Age (-), value [scale from 0 to 10] (+) and use [recreational services] (+)	Del Saz-Salazar & Garcia- Menendez (2003)
Prinsep ghat site (India)	Iterative bidding method, flexible payment vehicle (donation, fee on electricity bill or other), Tobit and truncated model, 181 questionnaires and face-to-face	Positive attitude towards the positive effect of conservation (+), travel expenses over last three years (+), professional or university qualification (+), occupation as an entrepreneur (+), occupation in own job (+), gender [female =1] (+) and age (-)	Dutta *et al*. (2007)
Changdeok Palace World Cultural Heritage Site (South Korea)	Dichotomous choice, access price, logistic model, 442 questionnaires and face-to-face	Perception of the price level (-), perception of the level of visit satisfaction (-), perception of the access price level (+), satisfaction with the current access price (+), belief in the level of involvement of access services cultural tourism (+) and income (+)	Kim *et al*. (2007)

Object (location)	Methodology (elicitation method, payment vehicle, econometric model, sample size, and questionnaire technique)	Determinants	Reference
Volcji Potock Protected Area (Slovenia)	Doubled bounded dichotomous choice, land use rate, bivariate probit model, 312 questionnaires and face-to-face	Monthly net income (+), frequency of visits (+), awareness of environmental preservation (+), concern with planning (+), perception of the risk of danger of destruction (+), environmental assets well evaluated by individuals (+) and number of values considered by the individual (+)	Verbič & Slabe-Erker (2009)
City of Valdivia (Chile)	Doubled bounded dichotomous choice, annual voluntary donation to a non-profit institution, bivariate probit model, 865 questionnaires and face-to-face	Cultural organization [member=1] (+), number of visits in the last year (+), gender [Male=1] (+), education [University=1] (+), city area (+) and employment status [active=1] (+) and cultural consumption [high=1] (+)	Báez-Montenegro *et al.* (2012)
Riverside of Ljubljana (Slovenia)	Doubled bounded dichotomous choice, property tax (residents) or access price (visitors), bivariate probit model, 278 questionnaires and face-to-face	Monthly net income (+), number of values (+), importance given to requalification (+), importance given to culture and environment (+), frequency of visits (+), damage proven by lack of conservation (+) and condition of residence (+)	Verbič, Slabe-Erker & Klun (2016)

Source: Own elaboration

Ideological orientation, a stock variable of personal background and beliefs of governmental priorities and policies, as a control variable about cultural goods and services elicitation is a topic to explore in cultural economics. However, when we search in environmental literature, we can find a wide range of studies about the role of political positions about environmental topics. Firstly, Dunlap *et al.* (2021) found that left wing voters tend to value the environment twice as other voters, prioritizing land use and preferences for more sustainable choices. Secondly, political orientations are highly related to support government intervention to achieve smart growth and individuals might oppose specific land use policies if they perceived a link with governmental activity opposite to their beliefs as environmental protection or higher taxes (Lewis *et al.*, 2010). Thirdly, individuals theorize their opinions about new concerns by party affiliation and do not select ideological positions closest to their existing set of beliefs (Goren, 2005). The environmental economics is particularly relevant to the topic of cultural economics, namely concerning the elicitation of stated preferences, as it has benefited from the methodology that has been adopted in this field for the valuation of cultural goods and services. Previous literature evidence that progressive ideological positions will positively affect WTP for goods and services whose benefits are collective (Carlsson *et al.*, 2012; Dupont & Bateman, 2012).

3. Cordoaria district

The Ministry of Culture and the Municipality of Oporto applied to a call to organize the European Capital of Culture and, in 1997, the Council of Ministers of the European Union determined that the submission had won. The Municipality of Oporto planned a cultural events agenda, a new infrastructure proposal and an urban regeneration strategy. Created in 1998, Sociedade Porto 2021 was the private agency with public capital with the task of planning and implementing all actions related to the European initiative, as defined in Decree-Law No. 418-B/98, of December 31, 1998. As part of the Porto Downtown Regeneration Strategy, five areas of intervention had been defined which aimed to promote housing, encourage the establishment of commerce, local amenities, and services, reorganize automobile circulation, and create a public transportation network adapted to the city downtown.

The architecture offices of Fernando Távora, Paula Santos/ Rui Ramos, Gonçalo Byrne, and Camilo Cortesão were invited by Porto 2001. In 1999, Evaluation Committee chose the architect Camilo Cortesão project. The team of architects led by Camilo Cortesão created underground car parks,

designed their own channels for the tram and bus, organized the stops, promoted the narrowing of communication channels, and planned the planting of trees along the streets and in the squares.

The Cordoaria headquarters has a group of protected buildings, including Clérigos Tower, a remarkable architectural ensemble designed by Nicolau Nasoni during the 18th century and a symbol of the city with stunning panoramic views from its top; Cadeia da Relação, a historic building from the 18th century that once served as a prison, currently used as a cultural and exhibition venue, which it is known for its baroque front; Palácio de Justiça, a city's courthouse building designed by Raúl Rodrigues de Lima in the 20th century; Santo António Hospital, a neoclassical architectural style designed by John Carr in the 19th century; and, University of Porto main building, designed by Carlos Amarante in the 19th century (Cabeças & D'Ara, 2003).

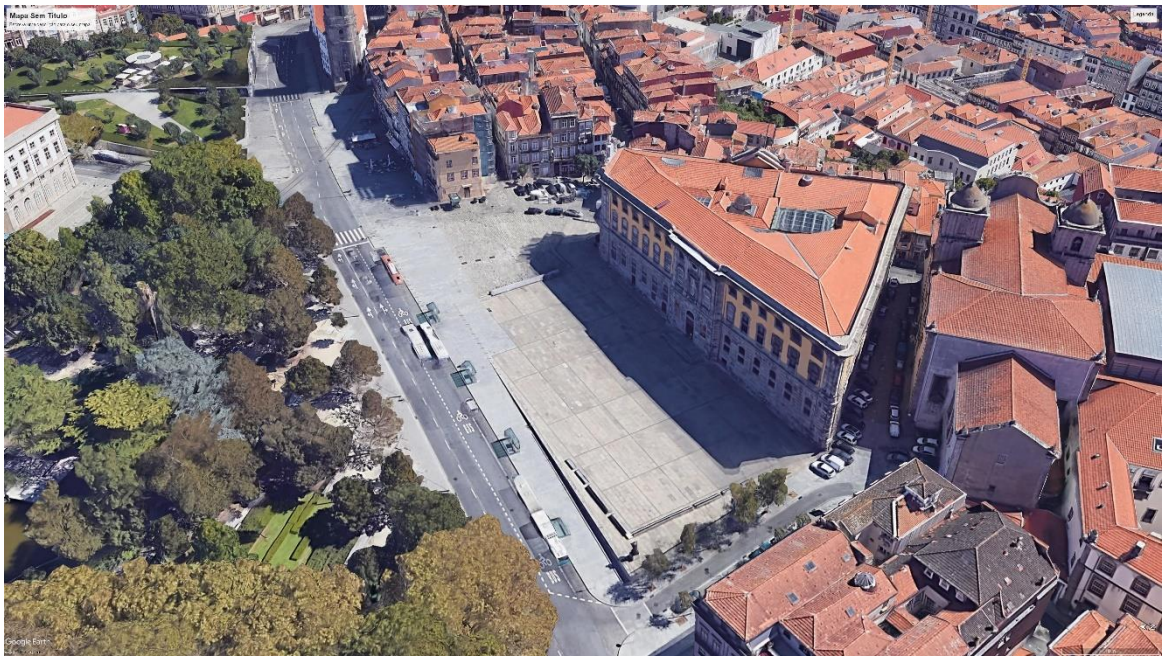
4. Methodology

4.1. Survey design

A methodology was applied to i) collect information, ii) assess preferences regarding cultural habits and practices, and iii) elicit the value attributed to the preservation of the landscape. The data collection process involved the use of a survey comprising three sections. A total of 555 questionnaires were collected in late November 2022. The first section of the survey focused on questions related to cultural habits and practices, including attitudes towards cultural goods and services, as well as their feelings about the landscape. The second section presented the CVM, explaining the elicitation method and the payment vehicle. The survey concluded with a set of sociodemographic questions. Participants for the questionnaire were recruited through the Prolific platform, a service that connects individuals willing to participate in surveys (Palan & Schitter, 2018). The only selection criterion was residency in Portugal.

One of the challenges of the CVM is to achieve reliable results. To address this, it is important to minimize strategic, hypothetical, information, response, or method biases. The survey was designed using easy language and rejecting concepts that could suggest a correct or incorrect response. Confidentiality was maintained by conducting the survey anonymously. Transparency was also emphasized, with the questionnaire providing accurate information and stressing the importance of responding based on rational decision-making in real-world contexts.

Figure 6. Landscape



Source: Google Earth

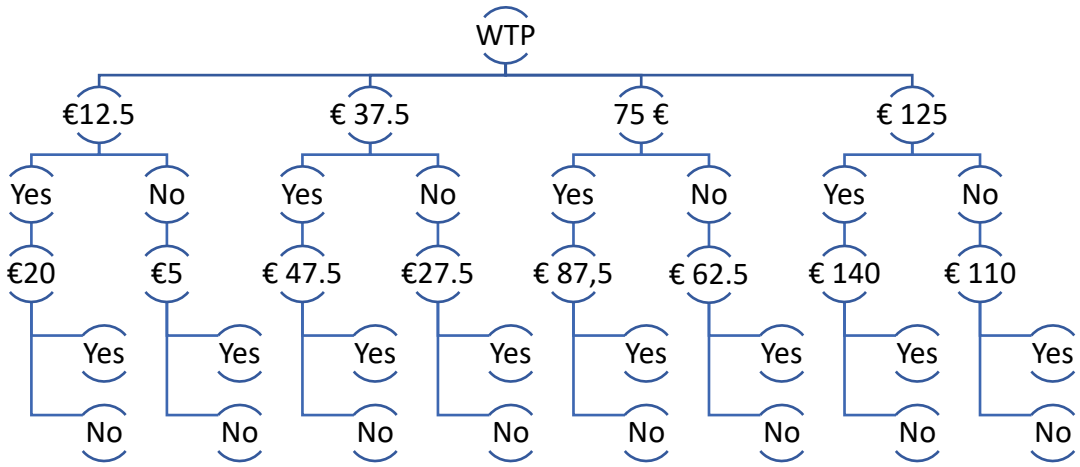
Figure 7. Contingent Scenario

Source: adapted from Google Earth

A validation process through a pilot test was launched before the survey was disseminated, which included open-ended questions to gather suggestions for improvements. The inclusion of uncertainty in the questionnaire, such as the option "maybe" and a self-assessment of response certainty in terms of WTP contribute to reducing biases, as suggested in the literature (Thompson *et al.*, 2002; Stevenson, 2013)

The CVM scenario included questions that aimed to elicit consumer preferences. Participants were presented with two images representing the current scenario after urban redevelopment intervention and a modelled landscape to support individual preference responses. They were confronted with a hypothetical scenario where a new building could be built in the square under analysis, as shown Figure 7. The virtual landscape was as neutral as possible to avoid adverse emotional effects. The projected hypothetical building complies with the dominant building altitude regulations and acceptable volumetric according to the existing urban rules, but without including any aesthetic attributes.

Figure 8. DBDC scheme



Source: own elaboration

Subsequently, the individuals were asked if they would be willing to donate to a crowdfunding campaign. The purpose of this fund would be to prevent the construction by paying compensation

to the property owner, who was assumed to have the right to develop the building. Therefore, the payment vehicle chosen was a donation. Firstly, charging a realistic access fee was not feasible, as it is not possible to charge a ticket to access a part of the city. Additionally, the payment of a fee, while mandatory, could introduce biases and might not be able to capture the values being measured (Duttaa *et al.*, 2007; Báez *et al.*, 2012). Secondly, the selection of a donation as a payment vehicle is consistent with the literature for situations where no other credible payment mechanism can be created (Sanz *et al.*, 2003).

Finally, to address the potential for protest responses in open-ended and simple dichotomous choice questions, researchers developed the DBDC method. In this method, individuals are asked if they would be willing to pay an amount after stating ("yes" or "no") whether they would be willing to pay an initial amount (Báez *et al.*, 2012; Verbič *et al.*, 2016). This method is consistent with the economic theory of welfare (Báez-Montenegro *et al.*, 2012). The DBDC has the advantage of being less susceptible to strategic bias and it is considered simpler for individuals (Snowball, 2008). According to the literature, this elicitation model is more efficient than the simple one (Haneman *et al.*, 1991). Figure 8 summarizes the response flowchart for the proposed exercise.

To minimize the risk of bias with origin from the initial random choice, it was decided to define the first bid based on selecting a range from four options: 1) up to €25, 2) between 25 and €50, 3) between 50 and €100, and 4) more than €100.

4.2. Data

The collected data is summarized in the following table. The sample population is young (with an average age of 28 years), predominantly male (61%), and an average household size of 3 individuals. Natural landscapes are appreciated to individuals, either because they think it makes them happier or because they think it is especially important to protect them. Finally, 32% of the sample has a household income between 12,000 and €24,000, and the average level of education is 15 years (with the majority having at least a bachelor's degree).

Table 18 shows that, although 222 of the 555 individuals are willing to accept paying a donation for the preservation of the landscape (at first initial bid), more than 76% answer affirmatively to their WTP the lowest initial bid. Moreover, 142 individuals initially refuse to pay a donation at the first bid but agree at the second question.

Table 17. Descriptive statistics of the sample

Variable	Descriptive	Mean	Standard-deviation	Lower	Upper
Gender	Male=1; Other=0	0.61	0.49	0	1
Income1	Annual income lower than €6000	0.01	0.12	0	1
Income2	Annual income between €6,000 and €12,000	0.10	0.30	0	1
Income3	Annual income between €12,000 and €24,000	0.32	0.47	0	1
Income4	Annual income between €24,000 e €36,000	0.23	0.43	0	1
Income5	Annual income upper than €36,000	0.32	0.47	0	1
Education	Number of years of schooling	14.77	1.95	6	20
Political ideology	Ordinal number between 1 (right) and 10 (left)	5.89	1.95	1	10
Landscape	Importance of the natural landscape for well-being [Agree and Strongly Agree = 1]	0.97	0.16	0	1
Conservation	Importance of preserving the natural landscape [between 1 and 5]	4.53	0.60	2	5

Source: own computation

At the end of the DBDC exercise, the survey included a question to assess the level of certainty regarding the previous responses. Out of the total individuals, only 36 expressed some uncertainty. It was then decided to exclude these observations from the exercise, resulting in a final sample size of 328 individuals who were willing to accept paying a donation, out of the initial total of 555 individuals.

Table 18. Relative frequency of affirmative responses to the initial bid

Initial bid	No.	Frequency
12.5	170	76.58
37.5	41	18.47
75	10	4.50
125	1	0.45
Total	222	100.00

Source: own computation

4.3. Model specification

The econometric model proposed by López-Feldman (2013) can be described by:

(3.1) $$WTP_i = \beta X_i + \varepsilon_i,$$

where WTP_i is a continuous variable that corresponds to the willingness to accept payment, which depends on the socioeconomic characteristics contained in the vector X_i, and ε_i is the error term, which assumes a normal distribution with zero mean and variance equal to σ. WTP_i is a latent variable whose observable variable corresponds to an affirmative or negative answer to whether or not the individual is willing to pay a certain amount b^j.

That is, ${WTP_i}^1$ and ${WTP_i}^2$ are the dichotomous variables that capture the responses to the amount b^1 and b^2.

If ${WTP_i}^1 = 1$ and ${WTP_i}^2 = 0$, then:

(3.2) $$\Pr(yes, no) = \Pr(b^1 \leq \beta X + \varepsilon_i < b^2) = \Pr\left(\frac{b^1 - \beta X}{\sigma} \leq \frac{\varepsilon_i}{\sigma} < \frac{b^2 - \beta X}{\sigma}\right) = \phi\left(\frac{b^2 - \beta X}{\sigma}\right) - \phi\left(\frac{b^1 - \beta X}{\sigma}\right)$$

If ${WTP_i}^1 = 1$ and ${WTP_i}^2 = 1$, thus $\Pr(\beta X + \varepsilon_i > b^1 | \beta X + \varepsilon_i \geq b^2) = 1$ once $b^2 > b^1$

By definition of the dichotomous choice model itself, whose amount questioned in the answer following an affirmative answer regarding WTP always assumes a value greater than the amount of that answer. Then,

(3.3) $$\Pr(yes, yes) = \Pr(\beta X + \varepsilon_i \geq b^2) = 1 - \phi\left(\frac{b^2 - \beta X}{\sigma}\right)$$

If $WTP_i{}^1 = 0$ and $WTP_i{}^2 = 1$, thus

(3.4) $$\Pr(no, yes) = \Pr(b^2 \leq \beta X + \varepsilon_i < b^1) = \Pr\left(\frac{b^2 - \beta X}{\sigma} \leq \frac{\varepsilon_i}{\sigma} < \frac{b^1 - \beta X}{\sigma}\right) = \phi\left(\frac{b^1 - \beta X}{\sigma}\right) - \phi\left(\frac{b^2 - \beta X}{\sigma}\right)$$

If $WTP_i{}^1 = 0$ e $WTP_i{}^2 = 0$, then $\Pr(\beta X + \varepsilon_i > b^1 | \beta X + \varepsilon_i \leq b^2) = 1$ once $b^2 < b^1$

By definition of the dichotomous choice model itself, whose amount questioned in the answer following a negative answer regarding WTP always assumes a value smaller than the amount of that answer. Then,

(3.5) $$\Pr(no, no) = \Pr(\beta X + \varepsilon_i \leq b^2) = \phi\left(\frac{b^2 - \beta X}{\sigma}\right) - 1$$

Finally, the maximum likelihood function is given by the sum of equations 2, 3, 4 and 5, through the Stata 15 program and it estimates σ and β.

5. Results

The econometric computation showed that the variables age and household size are not statistically significant at a confidence level of at least 90%. It is also found that the variables gender (male), education level, political ideology, importance of natural landscape for improving well-being, and importance of preserving the natural landscape are statistically significant. At a 10% level of statistical significance, males are willing to offer an additional €5.73 in donations compared to individuals of other genders, holding all else constant. At a 95% level of confidence, households with an income between €6000 and €12000 show lower WTP compared to the higher income bracket. An increase of one year in education level has a negative impact on WTP, at a 90% confidence level. At a 10% level of statistical significance, an individual who places more importance on the conservation of the natural landscape is willing to pay an additional €5.10 compared to someone who does not, holding all else constant. Finally, at a 90% level of confidence, each unit change on the scale where 1 is right-wing and 10 is left-wing corresponds to an increase of €1.54 in WTP for a donation, *ceteris paribus*. The results are shown in Table 19.

Table 19. WTP regression (DBDC)

Variable	Coefficient	p-value	Standard errors
Gender [Male=1]	5.730*	0.068	3.136
Income1	-12.588	0.425	15.76
Income2	-10.417**	0.048	5.262
Income3	-0.498	0.896	3.797
Income4	-0.463	0.911	4.145
Years of schooling	-1.422*	0.082	0.818
Political Ideology	1.540*	0.065	0.836
Landscape	-28.907***	0.008	10.863
Conservation	5.094*	0.069	2.804
Constant	38.959**	0.048	19.744
Observations	328		
Log-likelihood	-553.826		
Wald (9)	21.24	0.017	

in parentheses: *** p<0.01, ** p<0.05, * p<0.1
Source: own computation

Table 20. WTP estimation (DBDC)

Variable	Coefficient	Standard errors	p-value	95% Conf. Interval	
WTP	24.330	2.479	0.000	19.471	29.189

Source: own computation

Table 20 reveals the estimates, standard errors, test statistics and confidence intervals of WTP after the previous model estimation. WTP for a donation for the preservation of the Cordoaria landscape has a value between €19.47 and €29.19, with a confidence interval of 95%, which converts into an average value of €24.33.

6. Discussion

Urban redevelopment has become more important, and this has caused more focus on interdisciplinary studies that help with making decisions about how to manage and plan spaces. The concept of landscape itself considers the relationship between places and people. People attribute different values to places based on their attributes, and places contain multiple values (heritage, belonging, option). This heterogeneity of individual consumer preferences can lead to conflicts that need to be solved during the planning phase. This means that spatial distribution should consider how individuals experience the landscape, while landscape management should include attributes that may not be highly appreciated by individuals since they may not be fully aware of the environmental, social, or cultural externalities associated with the landscape.

Table 21 summarizes the achieved results and compares them with the literature review, noting partial coherence with the gender effect on WTP and overall coherence regarding the importance of landscape conservation. In the case of income, as the comparison is made with an individual with a higher income, it cannot be concluded that the result is inconsistent with the literature and economic theory.

Variables such as age, health status or residence were not included in the regression due to a lack of statistical significance, making it impossible to compare with the effects reported in previous research. The variable ideology is worth highlighting, as it was not considered in the literature, allowing us to conclude that as individuals perceive themselves more liberal, their WTP for landscape preservation increases. This conclusion is in line with the previous literature, where there is a positive relationship between affiliation with progressive parties and the WTP for goods and services with perceived public benefits. It is expected that higher education would lead to a direct increase in WTP, but as we may see, the sample population is highly educated with a high average level of schooling. Therefore, we need to take some caution about the effect of schooling on WTP because we are analysing a less heterogeneous sample in terms of education.

Table 21. Consistency between results and literature

Variable	Results	Literature
Gender [Male=1]	+	Dutta *et al.* (2007) the positive effect exists in the female gender, but Báez-Montenegro *et al.* (2012) also concludes that there is a positive relationship between male gender and willingness to pay.
Income2	-	Del Saz-Salazar and Garcia-Menendez (2003), Kim *et al.* (2007), Verbič and Slabe-Erker (2009) and Verbič, Slabe-Erker and Klun (2016) conclude that there is a positive effect between income and willingness to pay.
Years of schooling	-	It is not consistent with the conclusions of Báez-Montenegro *et al.* (2012)
Political ideology	+	
Landscape	-	
Conservation	+	Consistent with the conclusions of Dutta *et al.* (2007) and Verbič, Slabe-Erker and Klun (2016)

Source: own elaboration

This paper also explores the uncertainty. It means, people who do not know if they are willing to pay for the preservation of the cultural landscape ("maybe" answer). Their inclusion allows increasing in the number of answers, but eventually, it may cause bias because they may not answer what they would do in a real context (invalid positive bids or outliers). Even so, in a situation of low weight of individuals who reveal uncertainty, at the end of the CVM questionnaire, confirmed that the bias was reduced and can be mitigated with the elimination of these observations.

7. Conclusion

The cultural landscape is the interaction between humans and cultural heritage through a set of attributes that need to be valued. Over the last decades' evaluation literature has started to show interest in the interaction between individual political affiliation and responses in stated preference surveys.

To study whether individuals express lower or higher WTP in the function of their political ideology, we elicit consumer preferences for the preservation of the Cordoaria district landscape using the CVM. This method measures the total economic value, which includes both the use value (experience associated with direct or indirect consumption, current or future) and non-use value (externalities associated with the existence of the landscape regardless of its consumption).

This method is commonly used to estimate individuals' WTP for a good or service in the cultural domain and is also employed in eliciting consumer preferences for a cultural landscape. For this purpose, a survey was conducted, divided into three sections (the first section aimed to gather information about individuals' attitudes toward culture, the second was the contingent valuation scenario, and the third contains sociodemographic variables). Using the DBDC method, individuals were asked if they were willing to pay a certain amount, and based on their response, a second question was presented with a higher or lower bid.

Our results show a positive relationship between the left political affiliation of individuals and their responses on stated preference surveys. Other socio-demographics such as age and income have a positive impact on consumer preferences for cultural landscape.

Methodologically, this paper contributes to the literature for two reasons. The first reason is the treatment of uncertainty. While there are advantages to introducing an intermediate response in the questionnaire, there are no conclusive results regarding its statistical treatment. Therefore, an uncertain response was included between the dichotomous yes/no options, expanding the number of individuals who answered the double-bounded choice method. Then, at the end of the questionnaire, a question is included to assess the level of certainty of the last response, excluding observations from individuals whose answers indicated uncertainty. However, it is noted that the dimension of observations under these conditions was reduced. Secondly, although the use of donations as a payment vehicle is not new in eliciting consumer preferences for a cultural landscape, individual contribution to crowdfunding is an increasingly usual form of individual activism, and it was well received by individuals.

Alongside the traditional socio-demographic information and political affiliation, future research on non-market valuation surveys should also measure the confidence level in the provision of the good or service under consideration. This may be an indicator of a higher or lesser WTP expressed by respondents.

Chapter 4

Resources to preserve a cultural landscape: the impact of tourist tax as a payment vehicle

This essay aims to explore the robustness of the contingent valuation method (CVM), assuming a multiple-bound discrete choice (MBDC) elicitation format. This format incorporates individuals' certainty levels, where the payment vehicle for the WTP question is the tourist exclusively dedicated to funding the maintenance of the cultural landscape. A total of 386 residents in Portugal were surveyed, excluding those residing in the Greater Oporto, for whom the tourist tax does not prove to be a familiar, appropriate, and reliable payment vehicle, as the area under consideration is in the city of Oporto. A database was obtained and analysed using ordered logistic and generalized ordered logistic econometric methods, validating the latter model. Contributing to mitigating the scarcity of studies on consumer preferences elicitation for cultural landscapes, particularly in the national context, it is concluded that the intangible value depends positively on the gross annual household income and environmental sensitivity and negatively on the opinion about the urban landscape, age, and level of education. The direction of the latter two indicators go against the existing literature.

JEL: C91, D12 and Z10

Keywords: contingent valuation, generalized ordered logit, stated preferences, multiple-bounded

1. Introduction

According to the Survey of guest stays in hotels and other accommodations by the Statistics National Institute (INE), Oporto (Portugal) received approximately 2.27 million tourists in 2022, with an accommodation capacity of 11,694 rooms. Between 2012 and 2022, the number of overnight stays in the city increased from 1,815,157 to 4,819,168, a 165% growth. According to

the same survey, while in 2014 the accommodation capacity in tourist establishments was 66.3 per 1000 inhabitants, in 2022 it reached 108.8. 78.54% of the guests were foreign nationality. Several factors determine this economic dynamism and rapidly increasing growth rate.

Designated as a UNESCO World Heritage Site in 1996, Oporto's historic area experienced an economic and social revitalization in the late 20th century (Rodrigues & Campina, 2020). This process, including the redevelopment of residential buildings, public spaces, sanitation and water networks, and electricity infrastructures, was concentrated primarily within the city walls built in the 14th century, covering landmarks such as the Sé Cathedral from the 12th century, the D. Luis I Bridge from the 19th century, and the Church of S. Francisco from the 12th century (Cabeças & D'Ara, 2003). The protected area comprehends the entire zone of the classified area, including the Oporto and Vila Nova de Gaia downtowns, which were suburbs of medieval Oporto, dating back to the 12th century (Borges & Ribeiro, 2017).

In 2001, Oporto hosted the prestigious European Capital of Culture event, triggering initiatives for cultural programming, cultural infrastructure, urban and environmental redevelopment, and economic revitalization. These efforts boosted local cultural structures, improve public spaces and infrastructure, and engage the population (Santos *et al.*, 2002).

The city's classification as a UNESCO World Heritage site and hosting one of Europe's largest events were significant drivers for the growth of Oporto's tourism ecosystem, placing it a unique destination. This growth was accompanied by the creation of services that enhanced capacity, leading to increased guests and overnight stays (Borges and Ribeiro, 2017). The Francisco Sá Carneiro Airport in Oporto movimented 12,637,645 passengers in 2012, doubling in a decade, with 90,134 aircraft movements. Low-cost airlines, which increasing traffic by approximately 260% between 2005 and 2012, boosting tourism industry revenue significantly (Costa & Almeida, 2018).

The improvement of a travel destination not only generates revenue from accommodation, hospitality, transportation, and entertainment services but also creates jobs, stimulates economic internationalization, and diversifies local businesses, reducing dependence on specific economic activities (Vareiro *et al.*, 2013). However, the industry has negative externalities such as increased prices, population concentration, new crime phenomena, service congestion, and pollution (Lenzen *et al.*, 2018; Borges *et al.*, 2020; Durán-Román *et al.*, 2021; Göktas & Çetin, 2023). Because of that, local and national authorities implemented mechanisms like taxation to manage

overcrowding, infrastructure strain, and cultural and environmental degradation (Çetin *et al.*, 2017; Lopez-Sanchez & Pulido-Fernández, 2017; Durán-Román *et al.*, 2021).

Oporto approved a tourist tax in December 2017, noticed at Regulation No. 1135/2022, amounting to two euros per person per night, funding tourism services, cultural events, and public facilities (City Museum, Porto Municipal Theatre, or Cinema Batalha, for instance)

This study creates a hypothetical scenario, using the CVM, where individuals are asked for their maximum WTP increase in the current tourist tax to finance exclusively the preservation of the urban landscape of Cordoaria district, located in Oporto's downtown. This method captures individuals' values even if they do not consume the service, reflecting their WTP, and addressing the uncertainty inherent in non-market decisions (Snowball, 2008; Verbič *et al.*, 2016; Rotaris & Carrozzo, 2019). The elicitation technique adopted is the MBDC format, allowing respondents to express certainty in their decisions, acknowledging the uncertainty present in non-market decisions (Walsh & Poe, 1998; Alberini et *al.*, 2003).

This study aims to measure the value of the cultural landscape in a non-market context, understanding the preferences of Portuguese individuals regarding their cultural landscape through the payment of the tourist tax. The originality is validating the MBDC method, an underexplored technique among social scientists (Sajise *et al.*, 2021). The results from this study help decision-makers in managing spaces, guiding policy decisions concerning cultural heritage, and enhancing the attractiveness and competitiveness of the tourist destination.

The essay structure includes a literature review (2), study case description (3), methodology explanation (4), results on WTP for the tourist tax (5), implications for scientific research (6), and conclusions, summarizing the study, its limitations, and suggestions for future research (7).

2. Literature review

According to the OECD (2022), countries have prioritized heritage preservation in the distribution of recovery funds after the shock caused by the pandemic. The strategies vary widely, depending on the objectives of each recovery plan and the specific territorial characteristics of each country. These strategies range from building rehabilitation to the digitization of monuments and sites, with particular emphasis on sustainable tourism growth.

Taxation related to tourism (fees, indirect and direct taxes) has been implemented, justified by negative externalities (Biagi *et al.*, 2017; Çetin *et al.*, 2017) and to ensure financial resources to invest in infrastructure and services provided to tourists (Borges *et al.*, 2019; Rotaris & Carrozzo, 2019). Durán-Román *et al.* (2021) classified this taxation into five dimensions: i) environmental (fee for services in nature, tickets for access to natural parks, municipal garden access tickets, or nature restoration fees), ii) tourist services (fees for overnight stays in tourist accommodations or tickets for access to attractions, events, museums, and theatres), iii) recreational (taxes on bets and gambling), iv) infrastructure (access tickets or daily fees), and v) mobility (rental vehicle tax). The success of tourist tax can be explained by the flexibility of application to overnight stays, which can vary based on the season, individual characteristics, or accommodation type, and its relative ease to collect (Bratić *et al.*, 2012).

The application of a fiscal instrument can lead to a decline in competitiveness and attractiveness; thus, this value should not exceed the marginal cost of the negative externalities caused by tourism (Biagi *et al.*, 2017). Therefore, the destination's competitiveness is affected proportionally by the magnitude of the negative externalities and the demand elasticity for the services. Researchers have given attention to studying the value that the tourist tax should adhere to in order not to be inefficient (Sheng and Tsui, 2009, 2017). It should be noted, however, that in practice tourist taxes are not set to internalize the negative externality they are associated with, but to raise revenues for the municipality which can either be consigned to tourism related projects or not.

According to existing literature the impact of a tourist tax depends on several factors. First, there is no impact on demand in cases where the destination has a high level of geographic differentiation, which may not be the case for destinations with nearly perfect substitutes, where consumers can change their consumption patterns due to the introduction of a tax that increases the final service price (Durbarry, 2008; Bratić *et al.*, 2012). Second, how the revenue is applied, whether in financing events combating seasonality or enhancing differentiated services offered to consumers, can mitigate the negative effect that may arise from its application (Do Valle *et al.*, 2012; Pinto *et al.*, 2020).

2.1. Drivers of tourist tax

Studies using the CVM to estimate the value that non-residents attribute to the cultural landscape using the tourist tax as a payment vehicle are scarce (Rotaris & Carrozzo, 2019; López-del-Pino,

2021). Göktas & Çetin (2023), conducted a CVM survey on tourists in Istanbul to elicit the WTP for sustainable tourism using the tourist tax as the payment vehicle, and a payment card as the elicitation mechanism. Applying the Tobit model to the 428 observations collected, the WTP the tourist tax for heritage preservation ranged between €2.2 and 2.9.

Similarly, interviews conducted at major monuments and recreational areas in Otranto and Castro (Apulia, Italy) determined, using the same methodology, a WTP between 1.9 and 2.2 € if revenues were used for cultural heritage maintenance, 0.6 € more than if they had no information about its use (Rotaris & Carrozzo, 2019).

These studies found a positive correlation between the WTP the tourist tax and its impact on generating revenue for efficient management of infrastructure and maintenance of heritage sites, viewing the urban landscape as a holistic and differentiating element among its attributes. Although the CVM is widely used to evaluate WTP for tourism services and activities from a sustainability and monument preservation perspective, few studies incorporate the tourist tax as a payment vehicle when designing the questionnaire. Therefore, an effort was made to find results from other studies regarding WTP the tourist tax, to supplement previous articles, to achieve a comprehensive matrix of the main causal factors.

Table 22. Literature review

Variable	Sign	References
Gender	Male (+)	Durán-Román *et al.*, 2021
Age	Older (+)	Do Valle *et al.*, 2012
Schooling	Educated (+)	López-Sánchez & Pulido-Fernández, 2017 Rotaris & Carrozzo, 2019
Income	Income Higher (+)	Borges *et al.*, 2020
Environmental Awareness	Greater concern about environmental impact	
Other Variables	Nationality (+/-), hotel service characteristics (+/-), job occupation (+/-)	Rotaris & Carrozzo, 2019

Source: own elaboration

This payment vehicle was used in a questionnaire conducted in 2019 at major tourist locations in Andalusia, employing multiple correspondence analysis. The study concluded that 62.2% of individuals were willing to pay more for access to monuments and sites or tourist tax, respectively, to finance policies enhancing destination sustainability and travel experience. This willingness determinants include the purpose of the trip, the household income, the place of origin, and the daily budget (Durán-Román *et al.*, 2021).

In Portugal, using the Chi-Squared Automatic Interaction Detector algorithm, it was concluded that most tourists were not willing to pay the tourist tax to increase environmental preservation (Do Valle *et al.*, 2012). Analysing the application of the tourist tax in Oporto, it was found that nationality (individuals from countries with higher average incomes) and education level (individuals with higher academic qualifications) were statistically significant determinants of WTP a higher tourist tax (Borges *et al.*, 2019). These results are consistent with international literature (Durán-Román *et al.*, 2021; Göktas & Çetin, 2023).

Table 22 summarizes the results regarding WTP using the tourist tax as a payment vehicle. These studies highlight the importance of understanding the factors influencing tourists' WTP the tourist tax and the diverse range of results across various locations and contexts.

2.2. Multiple bounded discrete choice

In the CVM, the elicitation mechanism most used is the dichotomous choice, but others exist such as payment cards, referendums, bidding games, or open-ended questions (Wright & Eppink, 2016). With the evolution of this methodology, the introduction of certainty levels in responses was presented aiming at controlling for the lack of familiarity and preference uncertainty with respect to the scenario or the elicitation mechanism. This refinement was introduced as researchers started to conclude that, based on the hypothetical scenario, there might be a non-negligible possibility of individuals being confronted with questions they had never considered before (Boman, 2009). That is, given the information presented to the consumer, there is only one correct WTP value within a range of values (Hakansson, 2005; Li & Mattsson, 1995; Hakansson, 2005). Although the MBDC method can assume only a simple affirmative or negative response regarding each payment value, this elicitation method typically includes more than two bids, also collecting information about the certainty level of this payment being truly made in a real context (Alberini *et al.*, 2003; Evans *et al.*, 2003). Everyone indicates the certainty level for each of the amounts on a scale ranging from

definitely certain to definitely uncertain (Li & Mattsson, 1995; Wang 1997). In addition to the collected information, this methodology also provides a complete perspective on the set of available payment amounts (Alberini *et al.*, 2003) and minimizes the pressure effect that the questionnaire design using the single and DBDC methodology can impose (Bateman *et al.*, 2001), notably due to the chaining of questions based on the respondent's previous answer, with the potential anchoring bias that may arise, leading MBDC to more satisfactory answers (Vossler *et al.*, 2003).

Table 23 provides an overview of the evolution of the treatment of the MBDC elicitation method concerning the incorporation of uncertainty and econometric adjustment to the collected data. As can be easily inferred, the logistic method has been used by numerous studies, adopting variations ranging from the simple model (Li & Mattsson, 1995) to the multinomial (Shivan & Mehmood, 2012), including the mixed logistic (Siikamäki & Larson, 2015) and ordered logistic models (Cameron *et al.*, 2002). In this latter model, each category associated with the latent variable includes the observation for the bid and the associated certainty level, requiring the estimation of boundary parameters that provide information on the moment when individuals decide to switch from one category to the next, although they do not allow the direct elicitation of WTP.

Table 23. Summary of MBDC Elicitation method

Essay	Description	Method
Li & Mattsson (1995)	Combination of dichotomous questions with the introduction of a certainty level scale from 0 to 100%	Logistic
Welsh & Poe (1998)	Certainty levels "definitely certain" and "probably certain" were coded as positive willingness-to-pay responses, eliminating other responses from analysis.	Interval Regression
Cameron *et al. (*2002)	Each category corresponded to one of the bids considered in the survey.	Ordered Logistic
Evans, Flores & Boyle (2003)	Categorical variables with probability dimensions, including an intermediate response with 50% probability of the individual paying.	Probit with Random Effects

Essay	Description	Method
Alberini, Boyle & Welsh (2003)	Certainty level transformed into individual observations by programming each individual's response into segmented observations.	Panel Data with Random Effects
Shivan & Mehmood (2012)	Dependent variable was probability consisting of a set of binary variables, taking a value when the individual indicated a certain level of certainty.	Multinomial Logistic
Siikamäki & Larson (2015)	Database had multiple observations per individual, allowing analysis of preference heterogeneity	Mixed Logit Panel

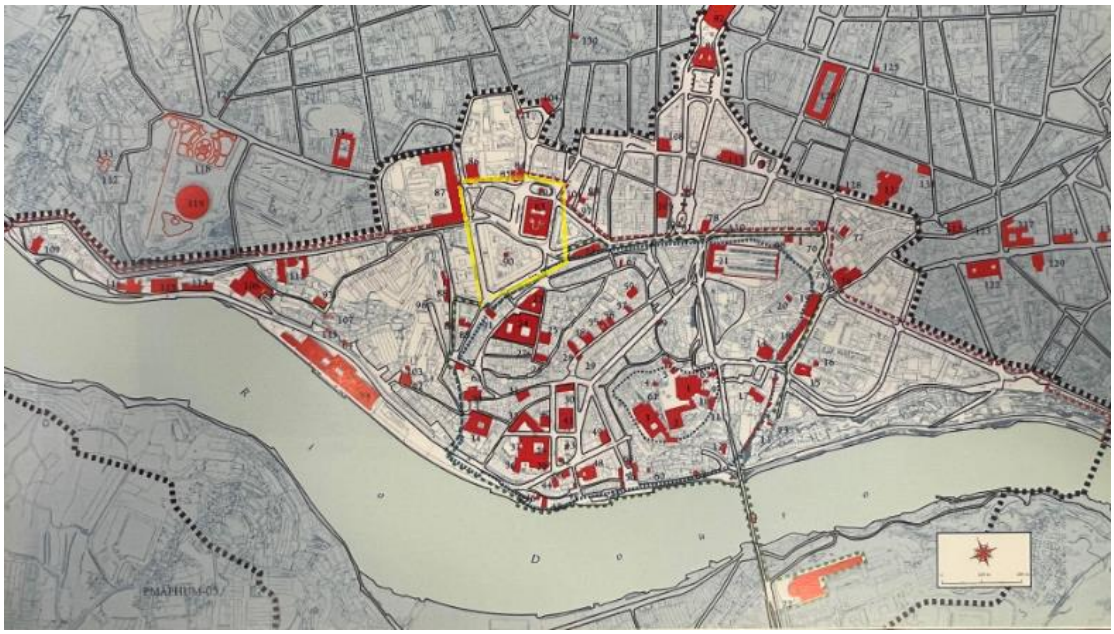
Source: own elaboration

3. Case study

The Cordoaria district was requalified as part of the European Capital of Culture project, involving various buildings within the UNESCO World Heritage protected area, notably the Relação Court and Jail, the Cordoaria Garden, the Santo António Hospital, the Clérigos Church and Tower, among other residential and commercial properties. The designated Western Intervention Area A, as shown in Figure 9, is bounded by the University of Porto's Rectorate building, encompassing the Cordoaria Garden, Lisboa Square, the surroundings of the Clérigos, and Restauração Street.

The Relação Court and Jail, a complex designed by Eugénio dos Santos and Carvalho and built in the 18th century, replaced another facility that had been destroyed by a fire in the previous century. In front of it lies the garden that was originally known as "Campo da Cordoaria" since 1611 (Borges and Ribeiro, 2017). Also in the 18th century, the Escola Real de Navegação (Royal School of Navigation) was established, which later became the Academia Politécnica (Polytechnic) and is now the main building of the Universidade do Porto (University). Additionally, the architectural ensemble of the Clérigos, designed by Nicolau Nasoni, was built in the same period. In the 19th century, Santo António Hospital was established, designed by John Carr, and in the following century, the Palácio de Justiça was built, designed by Raúl Rodrigues de Lima (Rodrigues & Campina, 2020).

Figure 9. Protected area of the Historic Centre of Oporto plan



Source: Borges & Ribeiro (2017)

4. Methodology

4.1. Sample description

As mentioned earlier, the CVM was applied to estimate the preferences of national tourists (or residents in Portugal) for the conservation, restoration, and maintenance of a cultural landscape. This method consists of an initial presentation of the policy under study, followed by a description of the market constructed for this purpose, and finally, an explanation of the payment vehicle (Noonan, 2003; Snowball, 2008).

Firstly, the questionnaire began by assessing individuals' relationship with the object under study. In particular, the well-being attributed to the consumption of cultural goods and services in general, and the landscape in particular, the importance of its access for the development of children and the country in general, the option value, and regarding public funding for this sector, as well as how they value certain measures related to the conservation and preservation of the cultural landscape. It included questions about the benefits of the landscape for future generations, its impact on the well-being of populations, its contribution to the conservation of cultural heritage, and the enjoyment of public space.

Secondly, the hypothetical market was explained primarily through the composition of Cordoaria district, which includes a green area, a playground, and several sculptures, with its maintenance being guaranteed by the Porto City Council. In turn, the tourist tax, amounting to two euros per night per person, contributes to the improvement and environmental preservation of the city and the upgrading interventions in the municipal public assets. The individuals were subsequently confronted with the hypothesis that this tax would be the only source of funding for the maintenance and conservation of this tourist area in the city, and exclusively dedicated to this end. The hypothetical market clearly defines that it is the responsibility of the City Council, the entity responsible for both the decision on the tourist tax (mean of payment) and the maintenance of the delimited area (object of the study), the coordination of the implementation of this policy change on which was expected at the maintenance, restoration, and conservation of the cultural landscape.

After the scenario explanation, questions eliciting WTP were presented, considering social and economic issues that could affect the response, including household income and its multiple regular expenses. Individuals were asked to pick a range of values (3 €, 5 €, 7 €, 9 €).

Finally, the last part of the survey included questions describing the characteristics of the individual, including age, gender, education, income, and the number of household members. The elicitation questions were only presented to those who, although declaring to live in Portugal, were not residents at Greater Oporto area. This question proved to be crucial in minimizing the risk of bias due to free riding since, for residents, the tourist tax would not be a realistic payment vehicle.

The questionnaire was conducted during the month of November 2023 through the Prolific platform, a service for sharing users available to participate in surveys. A total of 386 questionnaires were collected, using the MBDC elicitation methodology, where individuals answered through a matrix containing bids and certainty levels (Cristian *et al.*, 2004). The DBDC elicitation method is mostly used when individuals are allowed to express their level of uncertainty through a yes or no response (Snowball, 2008). However, when individuals, in addition to uncertainty, have several possibilities to choose their response, the MBDC is appropriate for assessing the probability of choosing each option, increasing the possibility of arriving at the actual value of WTP (Welsh & Poe, 1998; Evans *et al.*, 2003). Considering the potential bias in response for the intermediate uncertainty level, an ordinal scale between "definitely yes" and "definitely no" was chosen, including "probably yes" and "probably no," with "definitely yes" and "probably yes" responses being good predictors of individuals contributions to a public good (Vossler *et al.*, 2003). There are

benefits to presenting this axis randomly, as the ordering can influence estimation, which is known as anchoring bias (Alberini *et al.*, 2003).

Table 24. Distribution of positive WTP responses

Bid (person/night)	Definitely yes	Probably yes	Probably no	Definitely no
€3	137 (48)	133 (47)	14 (5)	2 (1)
€5	30 (10)	134 (47)	101 (35)	21 (7)
€7	6 (2)	38 (13)	121 (42)	121 (42)
€9	5 (2)	13 (5)	68 (24)	200 (70)

Source: own computation

Table 24 summarizes the responses found based on individuals' certainty levels. These are the answers directly obtained from the questionnaire. Subsequently, the responses were econometrically processed based on the level of certainty, as described in section 4.2.

As shown in Table 25, the justifications provided by the individuals for their unwillingness to pay are mainly related to the belief that the state should assume the responsibility for preserving the cultural landscape without resorting to direct taxation for this purpose (35%) or considering the current amount to be sufficient (23%). The use of revenue directly from tourists, even if residents in Portugal, as a funding source for the maintenance of the landscape, including expenses related to the conservation of its heritage, is not accepted by 15% who justify their unwillingness to pay a higher tourist tax because they do not reside in that area. However, only 5% of the sample population rejects the tourist tax as an appropriate payment vehicle for this purpose.

Table 25. Justification for the lack of WTP a higher tourist tax

Justification	Absolut frequency (No.)	Relative frequency (%)
No disposable income	12	12.00
The State should assume this responsibility	35	35.00
I do not consider it an appropriate mean of payment	5	5.00
Other*	4	4.00
I do not reside in this region	15	15.00
This issue is not a priority	3	3.00
I am not willing to pay more	23	23.00
I need more information/time to spend	3	3.00
Total	100	100.00

*Other: Individuals should not assume this responsibility (2); Only non-residents in Portugal should pay (1); Increased taxation may reduce the quantity demanded and decrease funding (1).

Source: own computation

4.2. Model specification

The MBDC can be estimated using the maximum likelihood estimator by the logistic regression, which aims to maximize the set of parameters that accommodate the presented model (Greene, 2012). As there is a natural order in the bids WTP_i, meaning observation i takes values $1, 2, \dots, J$ associated with categories where $1 < 2 < \dots < J$, choosing a model where the dependent variable does not consider this order results in inefficient maximum likelihood estimators. Thus, the model can be specified as $WTP_i^* = \alpha + \beta X_i + \epsilon_i$, where WTP_i^* is an unobservable latent variable, X_i represents the set of explanatory variables that influence the choice of a specific WTP bid based on the certainty level of these options, as specified in the table below, and ϵ_i is the error term. The parameters α and β are the parameters that the model will estimate. The latent variable WTP_i^* is divided into J intervals, which can be approximated to the observable variable WTP_i when it takes the value of J under the condition $\tau_{J-1} \leq WTP_i^* < \tau_J$ (Long & Freese, 2014). That

is, WTP_i takes the value of 1 if $\tau_0 \leq WTP_i^* < \tau_1$; of 2 if $\tau_1 \leq WTP_i^* < \tau_2$; of 3 if $\tau_2 \leq WTP_i^* < \tau_3$; of 4 if $\tau_3 \leq WTP_i^* < \tau_4$. $\tau_{1,}\tau_2, \ldots, \tau_j$ are the cutpoints or threshold of the latent variable WTP_i^* and the observed variable WTP_i falls within the value intervals defined by these intersections. Table 26 describes the J categories.

Table 26. Categories of the dependent variable

Category	Description	Lower bound	Upper bound	Observations
WTP_{i1}	1 if definitely or probably not willing to pay	0	3	116
WTP_{i2}	2 if definitely or probably willing to pay a tourist tax of €3 (definitely or probably not willing to pay €5, €7, and €9), 0 for other options	3	5	108
WTP_{i3}	3 if definitely or probably willing to pay a tourist tax of €5 (definitely or probably not willing to pay €7 and €9)	5	7	118
WTP_{i4}	4 if definitely or probably willing to pay a tourist tax of €7 (definitely or probably not willing to pay €9)	7	9	26
WTP_{i5}	5 if definitely or probably willing to pay a tourist tax of €9 (definitely or probably willing to pay €3, €5, and €7)	9	∞	18

Source: own elaboration

The dependent variable assumes values from 1 to 5 based on the WTP the tourist tax and the associated level of certainty. For example, the probability of choosing category 2, indicating a WTP a tourist tax of €3, requires a definitely or probably affirmative certainty, implying a definite or probable unwillingness for higher tourist taxes. Similarly, the probability of choosing category 3, revealing a WTP €5, requires a definitely or probably positive response to this bid, as well as a definite or probable negative willingness for higher bids. Categories 4 and 5 depend on a positive willingness for tourist taxes of €3, €5, and €7, provided there is a definite or probable negative willingness for a €9 tourist tax. Alternatively, each category can be considered as an interval between a lower bound and an upper bound, as indicated in the minimum and maximum columns

in Table 27. This considers the WTP more for the tourist tax. Thus, only responses indicating definite or probably willingness were included to ensure the consistency of the results.

Of the participants, 69.95% were willing to pay more for the tourist tax, while 30.05% of the responses were considered null due to unwillingness to pay more or lack of logic in the responses. Of these, 16 individuals with a positive WTP were classified as null due to the irrationality of the chosen certainty level in relation to the options presented. Additionally, 100 participants justified from the outset their unwillingness to pay more for the tourist tax for the maintenance and preservation of the cultural landscape.

There are four cut-off points or limits $(J-1)$ for the five categories, where individual i belongs to category j if $\tau_{J-1} \leq WTP_i^* < \tau_J$, for $j = 1, \dots, J$. Then, $Prob[WTP_i = \text{j}|X_i] = Prob\left[\tau_{J-1} \leq WTP_i^* < \tau_J\right] = Prob\left[\tau_{J-1} - (\alpha + \beta X_i) < \epsilon_i < \tau_J - (\alpha + \beta X_i)\right] = F\left(\tau_J - (\alpha + \beta X_i)\right) - F\left(\tau_{J-1} - (\alpha + \beta X_i)\right)$ for $j = 2, 3 \dots, J-1$. The ordered logistic model estimates for K coefficients, where K is the number of independent variables (Long & Fresse, 2014).

Table 27 describes the explanatory variables of the model and presents their main statistical indicators. Most of the sample consists of males (63%), singles (84%), young individuals (average age of 27 years), with an average annual household income of 40,568 euros, and with a higher education level (average of 14.7 years of schooling). According to the latest Population census conducted by INE in 2021, 52% of the population was female, the majority were between 25 and 64 years old, and only 18% had completed higher education as their highest level of education (INE, 2022). Therefore, the sample appears to be younger, predominantly male, and more educated compared to the country's overall demographics. According to the Portuguese Fiscal Authority, the average gross annual income of households is approximately 19,400€.

A crucial consideration in evaluating the ordered logistic model is the test of the presence of parallel regression assumption, which assumes that proportional odds mean that the coefficients of the independent variable regression are parallel ($\beta_{1\text{j}} = \beta_{2\text{j}} = \beta_{(k-1)\text{j}}$). The likelihood ratio (LR) test allows testing for no difference in coefficients across models using a chi-squared distribution with $K(J-2)$ degrees of freedom. Alternatively, the Brant Wald Test has the advantage of analyzing the proportionality of each variable by testing the null hypothesis ($\beta_1 = \beta_2 = \beta_{(k-1)}$) using a chi-squared distribution with $J(K-2)$ degrees of freedom. As this assumption is necessary for model

validation, in case the assumption is rejected, an alternative solution should be considered. The generalized ordered model estimates $J - 1$ equations simultaneously and is a more flexible model because relaxes the parallel regression assumption (Williams, 2016).

Table 27. Explanatory variables of the model

Variable	Description	Mean	Standard Deviation	Minimum	Maximum
Gender	Gender (Male=1; Other=0)	0,632	0,483	0	1
Age	Number of years of the individual	26,596	7,795	18	69
Income	Annual gross household income	40568	137639	4000	250000
Schooling	Number of years of schooling	14.681	1.885	9	17
Landscape	Preservation of urban landscapes enhances the well-being of populations [Scale from 1 (Strongly Disagree) to 5 (Strongly Agree)]	4.236	0.834	1	5
Environment	The tree canopy of Cordoaria helps reduce temperature in summer and increase humidity [Scale from 1 (Strongly Disagree) to 5 (Strongly Agree)]	4.528	0.612	2	5

Source: own elaboration

5. Results

The model was estimated using Stata 15.1 software. Table 28 presents the results estimated by the ordered logit regression (A) and generalized ordered logit regression (B) methods, showing first the coefficients associated with the explanatory variables and then some model evaluation indicators, including the likelihood-ratio test of proportionality of odds, Brant test, and Bayesian Information Criterion (BIC) and Akaike's Information Criterion (AIC).

Table 28. Ordered and generalized ordered logit (Landscape)

	(A) Ordered Logit		(B) Gologit	
VARIABLES	(1)	(1)	(2)	(3)
Age	-0.0316**	-0.0355**	-0.0285*	-0.0437**
	(0.0132)	(0.0146)	(0.0156)	(0.0220)
Schooling	-0.150***	-0.132**	-0.144**	-0.197*
	(0.0554)	(0.0647)	(0.0600)	(0.104)
Log (Income)	0.262*	0.0807	0.367**	0.260
	(0.142)	(0.179)	(0.155)	(0.206)
Gender	0.213	0.0895	0.301	0.247
	(0.196)	(0.237)	(0.229)	(0.383)
Landscape	-0.233**	-0.251*	-0.310***	-0.0386
	(0.0956)	(0.150)	(0.118)	(0.147)
Environment	0.374**	0.542***	0.305*	0.252
	(0.162)	(0.195)	(0.171)	(0.274)
/cut1	-0.444			
	(1.709)			
/cut2	0.794			
	(1.714)			
/cut3	2.600			
	(1.727)			
/cut4	3.586**			
	(1.740)			
likelihood-ratio test of proportionality of odds				
$\chi^2_{K(J-2)} = \chi^2_{7(5-2)} = \chi^2_{21}$	36.88			
Prob > χ^2_{21}	0.0174			
Wald test				
$\chi^2_{J(K-2)} = \chi^2_{5(7-2)} = \chi^2_{25}$	25.48			
Prob > χ^2_{25}	0.112			
Log-likelihood	-527.682		-492.856	
Wald	23.434		34.697	
p-value	0.001		0.010	
AIC	1075.363		1027.712	
AIC/N	2.786		2.662	
BIC	1114.922		1110.785	
Observations	386		386	

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1
Source: Own computation

5.1. Ordered logit

The likelihood ratio chi-square of 23.434 with a p-value of 0.001 tells us that our model is statistically significant. The explanatory variables income, age and schooling are statistically significant at 99%, 95% and 90% level of confidence, respectively. The independent variable landscape and environment are both statistically significant. As the estimator obtained by the maximum likelihood method reflects the estimated effect of the explanatory variable on the unobserved latent variable, not the willingness to pay, which is the desired outcome, we calculate the marginal effects, presented in Table 29. The marginal effects allow us for a better interpretation of the effect of each explanatory variable on the probability of choosing one category over another. This means that individuals' willingness to pay more for the tourist tax falls within a certain range of values compared to others.

The probability of an individual choosing higher categories decreases as age increases, with other variables in the model held constant. Similarly, an increase of one year in education has a positive effect on the probability of choosing lower categories but it is negative concerning categories 3 or higher. The annual gross income of the household and individuals' willingness to pay for the tourist shows a positive relationship.

Since the gender variable is not statistically significant, the analysis concerning the sociodemographic explanatory variables is concluded. However, the effects of two relationship/affinity variables remain to be interpreted. The statement "preservation of urban landscapes increases the well-being of populations," evaluated on a scale from 1 (Strongly Disagree) to 5 (Strongly Agree), has a negative relationship with the ordered categorical dependent variable. The negative signal reveals that higher satisfaction about the impact on urban landscape leads to a higher probability to choose lower categories of bids, *ceteris paribus*. Inversely, higher agreement related to the effect of Cordoaria's tree cover on reducing summer temperatures and increasing humidity, higher the probability of choosing higher categories of bids, given that all the other variables in the model are held constant.

Returning to Table 28, we can see that the likelihood-ratio test of proportionality of odds chi-square of 36.88 with a p-value of 0.017. Then, the null hypothesis (violation of the assumption that the regressions are constant for all levels of the response variable) is rejected. However, Brant test chi-square of 25.48 with a p-value of 0.112, does not reject the null hypothesis. Therefore, it was

decided to estimate the generalized ordered logit method, which relaxes the parallel lines assumption.

Table 29. Marginal effect (ordered logit)

VARIABLES	(1)	(2)	(3)	(4)	(5)
Age	0.0065**	0.0012*	-0.0047**	-0.0017**	-0.0013**
	(0.0027)	(0.0001)	(0.0020)	(0.0008)	(0.0006)
Schooling	0.0309***	0.0059*	-0.0224***	-0.0081**	-0.0060**
	(0.0112)	(0.0030)	(0.0085)	(0.0032)	(0.0027)
Log (Income)	-0.0539*	-0.0097	0.0391*	0.0141*	0.0105*
	(0.0288)	(0.0067)	(0.0216)	(0.0078)	(0.0062)
Gender	-0.0444	-0.0071	0.0320	0.0112	0.0083
	(0.0411)	(0.0064)	(0.0296)	(0.0102)	(0.0076)
Landscape	0.0480**	0.0087*	-0.0348**	-0.0125**	-0.0094**
	(0.0197)	(0.0047)	(0.0150)	(0.0054)	(0.0040)
Environment	-0.0770**	-0.0139*	0.0558**	0.0201**	0.0150**
	(0.0338)	(0.0073)	(0.0250)	(0.0095)	(0.0067)
Observations	386	386	386	386	386

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

Source: own computation

5.2. Generalized ordered logit

Computing the generalized ordered logit model the same as the previous model (5 categories and 7 independent variables) yields negative predicted probabilities (the probability of selecting a specific category must necessarily be between zero and one, so violating this non-negativity property renders the results invalid). The origin of this problem could be the fact that the two upper categories (4 and 5) have few observations. The solution to overcome this issue is to aggregate

both categories, subtracting one from the total in the model. The results align with those presented earlier.

Once again, interpreting the coefficients is more intuitive and useful when calculating marginal effects. The results are shown Table 30, where the explanatory variables are on the vertical axis, and each of the now four categories are on the horizontal axis. The positive and statistically significant coefficients of the explanatory variables, gross household income, and the environmental impact of the landscape, indicate that the higher these coefficients, the greater the probability of consumers choosing a higher category. Conversely, in the explanatory variables, age, years of education, and the effect of urban landscapes on well-being, which have negative coefficients, the probability of individuals choosing lower value categories is higher.

Table 30. Marginal effects (generalized ordered logistic)

VARIABLES	(1)	(2)	(3)	(4)
Age	0.0073**	-0.0003	-0.0030	-0.0040**
	(0.0030)	(0.0031)	(0.0036)	(0.0020)
Schooling	0.027**	0.0078	-0.0170	-0.0179**
	(0.0132)	(0.0130)	(0.0137)	(0.0091)
Log(Income)	-0.0167	-0.0724**	0.0655*	0.0236
	(0.0369)	(0.0322)	(0.0348)	(0.0184)
Gender	-0.0185	-0.0537	0.0504	0.0219
	(0.0493)	(0.0494)	(0.0509)	(0.0332)
Landscape	0.0518*	0.0234	-0.0716**	-0.0035
	(0.0306)	(0.0305)	(0.0284)	(0.0133)
Environment	-0.112***	0.0380	0.0510	0.0229
	(0.0401)	(0.0369)	(0.0402)	(0.0248)
Observations	386	386	386	386

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

Source: Own computation

Therefore, an individual ten years older has a probability of choosing category 1 over any other higher by 7.32%, holding other variables in the model constant at a 95% confidence level, and a lower probability by 3.97% of choosing the highest category, ceteris paribus. On the other hand, an increase of one more year of education has the effect of increasing the probability of choosing category 1 by 2.72%, all else being equal, and a lower probability by 1.79% of choosing the

maximum category over any other, at a 5% significance level. A 10% increase in the annual gross income of the household negatively impacts the probability of choosing category 2 by 72.4%, holding other variables in the model constant at a 5% significance level, and increases the probability by 65.5% that this individual falls within the range of category 3, at a 90% confidence level.

As with the interpretation of the ordered logistic model, there is now a negative relationship between the evaluation of the contribution of urban landscapes to the well-being of populations and the selection of a higher category over another. Conversely, there is a positive relationship between the impact of the landscape in environmental terms and the selection of higher categories. Therefore, an increase of one unit in the individual's response (increasing the level of favourability regarding the impact of an urban landscape on well-being) has the effect of increasing the probability of choosing category 1 by 5.18%, at a 10% significance level, and decreasing the probability of choosing category 3 by 7.16%, at a 95% significance level, all else being equal. An increase of one unit (the more favourable the individual's opinion regarding the effect of Cordoaria's tree cover) results in an 11.2% reduction in the probability of choosing category 1, all else being equal. The probabilistic effect on the remaining categories is not statistically significant.

As previously observed, if ordered logistic regression fails the assumption that the coefficients that describe the relationship between the lowest versus all higher categories of the response variable are the same as those that describe the relationship between the next lowest category and all higher categories, then the generalized ordered logit model is most appropriate. Additionally, i) 48 fewer points in terms of the AIC (strong evidence), and ii) 4 fewer points in terms of the BIC (weak evidence). This suggests that it is the best fit for the data, as lower values associated with these indicators indicate a preference for the complexity and appropriateness of the model.

6. Discussion

The growing concerns about sustainability have justified the introduction of measures, both from a regulatory and fiscal perspective, to mitigate the negative externalities of tourism. The tourist tax is one of these widely used instruments, although its purposes vary depending on the city/region where it is applied. It aims to address the problems of tourist pressure, such as ecological footprint, congestion, price increases, and other negative effects (Lenzen *et al.*, 2018; Göktas & Çetin, 2023).

In Oporto, a tourist tax has been implemented since 2018 to compensate for the negative impacts that arose with the increased attractiveness of the destination due to its unique heritage assets. It was considered an appropriate payment vehicle to elicit the preferences of consumers regarding the cultural landscape. Thus, facing the hypothetical scenario where the tourist tax revenue finances only the area delimited by Cordoaria district and serves as the single source of funding for the maintenance and conservation of this tourist zone in the city, this contingent valuation study reveals that most individuals (69.95%) are willing to pay a tourist tax higher than 2 euros/night/person to preserve the cultural landscape in question. This proportion of positive responses is consistent with previous studies, such as in Andalusia, where the percentage of individuals willing to pay the tourist tax is at least 62.2% (Durán-Román *et al.*, 2021) or in Santiago de Compostela, where this percentage does not exceed 63% (Soares *et al.*, 2022). However, in Oporto, only approximately half of the surveyed tourists were aware of its existence (Borges *et al.*, 2020).

In the MBDC method, which is considered by researchers to enhance the precision of estimates (Welsh & Poe, 1998; Evans *et al.*, 2003), the dependent variable can be transformed into several ordinal categories ranging from 1 to J, which could incorrectly suggest that the data fit linear regression models (Long & Freese, 2014). In this example, the distance between category 1 (a tourist tax between 0 and 3) and 2 (a tourist tax between 3 and 5) is unknown concerning the distance from the latter to category 3 (a tourist tax between 5 and 7). Therefore, when the variable is ordinal, the assumption that distances between categories are equal does not make sense, and nonlinear or discrete methods should be used. Among these models are the ordered probit model, binary choice model, multinomial logistic model, and ordered logistic model (Cameron *et al.*, 2002; Shivan & Mehmood, 2012). The latter is appropriate since it is appropriate when response choices follow a natural order, and the proportional probability assumption (or parallel lines) is not violated (Vessler *et al.*, 2003), in addition to sharing common properties with logistic regressions, including linearity between the dependent and independent variables, estimation of parameters through maximum likelihood estimation, and requiring complete data for each observation (Long & Freese, 2014). Although the likelihood ratio test validates the model, it is not possible to reject the hypothesis that the relationship between independent variables and the dependent variable is the same for all categories. The problem of violating the assumption of parallel regressions, which implies that all coefficients of the model's regressions are identical, was overcome by using the generalized ordered logistic method. Additionally, by combining categories with few observations,

the problem of model results assuming negative probabilities was resolved, which would invalidate any interpretation of the results. The generalized ordered logistic model fits the database better, not only because the likelihood ratio test rejects the null hypothesis that the parameters of the independent variables are zero but also because the Bayesian Information Criterion (BIC) and Akaike's Information Criterion (AIC) also support the preference for the generalized ordered logistic model.

The results demonstrate that the variables age, years of schooling, and gross annual household income are statistically significant. An individual ten years older has a higher probability of choosing a lower category concerning the others, all else being constant. This negative relationship between the probability of choosing higher WTP categories with increasing age is not consistent with the literature, where a positive relationship exists (Do Valle *et al.*, 2012). It is not easy to infer what justifies this original finding in this study, but two possibilities can be considered: on the one hand, lack of familiarity with the payment vehicle; on the other hand, the belief that it is not an appropriate payment for the object in question. In fact, category 1 is relatively more selected among the population over 29 years old (40.66% compared to 26.78% of the population under 30 years old), and, grouping the first two categories, they account for 72.53% of individuals answers. However, for the justification of the lack of WTP, only 5% of individuals considered that the tourist tax was not a suitable payment vehicle, allowing the hypothesis of bias to be rejected.

Another originality in this study refers to education, as a higher number of years of schooling increases the probability of an individual choosing a lower WTP category concerning the other categories, all else being constant. This is a surprising result compared to the existing literature, since scientists have detected a positive relationship between higher education levels and the higher WTP manifested by consumers for the tourist tax (López-Sánchez & Pulido-Fernández, 2017; Rotaris & Carrozzo, 2019). This is a sample with elevated levels of schooling, mostly with higher education, which can promote higher levels of financial literacy and a greater consideration of the benefits to be gained from the tourist tax, namely its real impact on the preservation of the landscape and the efficiency of the state in achieving the objectives of the fiscal instrument. It is noteworthy that the main reason for not being willing to pay more for the tourist tax for these purposes is precisely because individuals believe that the state is responsible to protect the cultural landscape.

Since the gender variable is not statistically significant, only the analysis of the socioeconomic variable income remains. An individual with a higher gross annual household income has a higher probability of choosing higher WTP categories for the tourist tax, keeping the other independent variables in the model constant. This conclusion is consistent with the existing literature on this subject (Borges *et al.*, 2020).

The model also includes how the evaluation of the impact of the urban landscape on well-being affects the selection of one category over another. In fact, there is a negative relationship because individuals who believe that the urban landscape contributes to well-being are more likely to choose lower categories. This means that people who are more willing to pay for the preservation of this specific landscape are those who assessed the contribution of the urban landscape to well-being less positively. A curious reflection on the sustainability of cities and the quality of life they offer.

7. Conclusion

This article aimed to investigate the determinants of WTP for the tourist tax, focusing particularly on its financing function, to preserve the cultural landscape of Cordoaria (Oporto). Cordoaria is surrounded by protected and classified buildings, and its garden includes various recreational spaces and a collection of public art, justifying a redevelopment intervention integrated into Oporto european capital of culture event. This event followed another, the classification of Oporto's downtown as a UNESCO World Heritage Site, leading to an exponential growth in tourism, highlighting the importance of cultural preservation for the differentiation and enhancement of a destination's competitiveness. However, the negative externalities of this demand also increased, justifying a specific evaluation of the factors that determine the value of the cultural landscape.

Since the city of Oporto has been implemented a tourist tax of 2 € per night/person in 2018, this payment vehicle was used to determine the WTP for the conservation and maintenance of the cultural landscape of Cordoaria. Relaxing the constraint of the parallel regression assumption, generalized ordered logistic method results concluded that younger individuals, with higher income, and fewer years of education, are more likely to have a higher WTP the tourist tax. In addition to these explanatory variables, two other factors that can affect WTP and be included in the model are related to individuals' connection to urban landscapes and their environmental impact. It was concluded that the probability of expressing a higher WTP is negatively correlated with individuals'

opinions regarding the impact of urban landscapes (in general) on well-being and positively correlated with the impact of green areas on environmental indicators.

These results have implications for national and local government authorities developing policies that must consider the sustainability of tourism, as well as consumers' perceptions regarding the cultural, social, and environmental protection of territories and populations. The efficiency of the tourist tax depends on its value. Therefore, this study, along with the validation of the adopted methodology, can add value to the decision-making mechanism because: i) there is a favourable opinion regarding the use of this fiscal instrument (only 30.05% are not willing to pay or do not intend to pay more than the currently charged tax), and ii) it underscores the importance individuals attach to the cultural landscape (69.95% are in favour of an increase in the tax for the maintenance of green areas, environmental awareness, and cultural promotion, among other conservation activities).

As this study concluded with a sample consisting exclusively of residents in Portugal, it is relevant for future research to include both national and international tourists in the sample and to expand the methodology to other study objects since each one presents unique characteristics, making it impossible to generalize conclusions to other landscapes with different features. This note becomes even more important when, as initially mentioned, most visitors (and, by extension, donors) come from abroad.

Chapter 5
Conclusion

The state plays a unique role in the economy. On one hand, it collects tax revenues using (often) progressive taxes and then assumes various expenses with the goal of struggling inequalities (Varian, 1992; Mas-Colell *et al.*, 1996). In addition, it interferes with market failures to ensure a more efficient allocation of economic resources through regulation and taxation (Frank & Bernanke, 2001). One of the most important market failures is externalities, which can be positive (benefits) or negative (costs) and impact the objective of efficiently allocating economic resources (Snowball, 2008; Towse, 2010). Cultural goods and services show evidence of externalities, which often justify public intervention in culture, as there are benefits associated with their provision that goes beyond their consumption dimension (Throsby, 2001; Frey, 2003).

Efficiency is achieved through maximizing consumer surplus, calculated as the difference between the maximum amount a consumer is willing to pay and the amount they pay (Bedate *et al.* 2004; Herrero *et al.*, 2012; Mazadiego *et al.*, 2018). To achieve this, it is necessary to know WTP, which reflects the value of the consumer to the service. From the consumer's perspective, perceived value depends on the satisfaction derived from it, perceived quality, brand, needs, competition from complementary or substitute services, experience, expectations, emotion, and reputation (Zhu & Zhang, 2010; Huang *et al.*, 2013).

In the 1960s, Robert Davis used the CVM for the first time to value outdoor leisure activities (Brown, 2003). In this thesis, we examine which price consumers are willing to pay for a concert, an educational service activity, and the preservation of a specific landscape. In the provision of cultural goods and services, the monetary value can transcend the market transaction price. Therefore, the CVM, by calculating both use and non-use values, permits obtaining the benefits associated with the provision beyond its market value (Mitchell & Carson, 1989; Arrow *et al.*, 1993; Carson et al, 2013). Furthermore, this information is essential for the state to allocate resources efficiently and

ensure equity, preventing lower-income individuals from being excluded from consumption (Snowball, 2005; Towse 2010).

This last chapter aims to synthesize the main conclusions from the previous papers and examine their impact on the objectives of this dissertation. It concludes with a set of reflections on public intervention in these markets and it finishes with a future research guide.

1. Essays conclusions

1.1. The impact of the Covid-19 pandemic on WTP for cultural facilities: the case of Casa da Música Foundation (Chapter 1)

The first paper, focusing on Fundação Casa da Música, aims to i) understand the factors determining consumer preferences in performing arts, ii) determine the value attributed to the services provided, and iii) assess the impact of the pandemic on consumer preferences elicitation. This last question, not initially planned, emerged due to the period during which this study was conducted.

Two hypothetical scenarios were constructed. The first, based on information regarding prices and costs for each activity, assesses WTP for concert access (tickets) and a donation for financing educational service activities. These means of payment were suitable because they were universal (globally understood), credible (commonly used in market contexts for these activities), and familiar (commonly used in this institution). In the second scenario, in the context of the pandemic, the question about WTP under the new conditions was presented.

Gender, age, gross annual income, and individual qualifications significantly influence consumer preferences. Although education level is not statistically significant, income plays a positive role. This means that the probability of an individual choosing higher categories is higher compared to selecting lower categories, all other being constant. The same applies to individuals who regularly attend performing arts venues, particularly if they are familiar with and value the resident orchestras of this institution. Males are more likely to choose higher categories, holding other variables constant. Residence in the heart of Greater Porto is a crucial factor in the WTP for post-pandemic.

Individuals highlight the impact of educational services on citizens development. Firstly, high level of individuals who reveal the ability to pay more for a donation. Secondly, their preferences reveal the social value of educational service. Finally, individuals whose households have children reveal

higher stated preferences. The most common rationale for not making donations (45.16%) is the belief that their taxes should cover this responsibility of the public sector. Then, the individual, even if are not able to pay more, understands the externalities of educational services.

Considering that use value refers to both the direct satisfaction consumers derive from the service and what exists beyond consumption itself, which includes non-use value, such as legacy, existence, and option values, the CVM concluded that users have a higher WTP than non-frequent users.

The value attributed to a concert decreased with the emergence of the pandemic. This could be the result of consumer preferences adapting to reduced offerings due to consumption interruptions, which are essential to forming the value in these services. Additionally, since the risk of contagion was not eliminated, users may still have concerns, particularly given that, on average, they are older than non-users. The reduction in WTP is a result of this combination of factors that affect individual responses differently. Moreover, two significant changes occurred during this period for many families: a shift in cultural consumption toward audiovisual and entertainment media, available during the contingency when in-person activities were closed, and, therefore, situations of layoffs or unemployment, reducing family incomes and affecting various consumption decisions due to the decrease in families' budget constraints. The effect of a pause on the learning-by-consuming preferences formation process may explain the slowly audience recover.

1.2. How does political ideology affect the individual's willingness to pay for crowdfunding to preserve a cultural landscape? (Chapter 3)

The analysis of the utility that individuals derive from a cultural landscape can provide insights into how local and governmental authorities make decisions regarding space distribution (urban planning) and the concept of specific spaces (micro-urbanism or landscape architecture).

This essay begins with the redevelopment plan conducted by the organizing entity of Porto 2001, specifically the Cordoaria district, to analyse consumer preferences for a cultural landscape. The study focuses on the treatment of uncertainty, the use of donations in a crowdfunding campaign to measure WTP, and the introduction of a preliminary question to evaluate preference scales and avoid starting point bias.

To achieve these objectives, the CVM was applied. Participants were asked to examine two images: one representing the current situation and the other where the scenario was modelled. The hypothetical scenario assumes the construction of a new building that alters the existing landscape. This virtual landscape is as neutral as possible, complying with the altitude and volumetrics applicable to existing urban regulations, while removing any aesthetic features. Individuals were then questioned about their willingness to contribute to a crowdfunding campaign to prevent the construction, replacing the state in compensating the property owner who would have the right to develop the urban operation in question. Using donations is advantageous because the access price would not be familiar or realistic since the space is publicly accessible, and taxes could not capture the desired values as it would be mandatory.

By employing the DBDC method, which is less sensitive to strategic bias, we obtained a donation to crowdfunding between €19.47 and €29.19, to preserve the landscape. Gender, gross annual household income, years of education, political ideology, and opinions on nature conservations are the drivers of individual valuation. An individual considering landscape conservation more important was willing to pay, on average, an additional €5 compared to someone who did not share that opinion, all else being equal. Finally, a one-unit change on a scale of 1 to 10, where one represents right-wing and ten represents left-wing ideology, increased the willingness to contribute to the crowdfunding campaign by €1.55, ceteris paribus. It means that the elicitation of cultural landscape depends on the political ideology of individuals.

1.3. Resources to preserve a cultural landscape: the impact of tourist tax as a payment vehicle (Chapter 4)

The purpose of the third and final paper is to externally validate the MBDC elicitation method for consumer valuation of cultural landscapes using tourist tax as a payment vehicle. The results can support policy decisions, particularly in identifying investment priorities and resource allocation according to the impact of these investments on society.

The value of a cultural landscape can be beyond its utilitarian objective, so analysing preferences revealed by the market could result in underestimated estimates. The growth of tourism in Oporto has caused negative externalities whose justification led to the creation of a tourist tax. This essay specifically uses the tourist tax to develop a hypothetical scenario where this fiscal instrument is used exclusively to preserve the cultural landscape of the Cordoaria district. The validation of

MBDC, gathering information from the individuals about their certainty of pick a specific bid on a scale, is important because individuals might have never reflected on the matter before, and the literature has not explored enough this elicitation method to threat uncertainty that affects valuation.

Most individuals have the capacity to pay a higher tourist tax than the current one which reveals the relevance of cultural landscape. The drivers are age, years of education, gross annual household income, environmental sensitivity, and opinions on the impact of the urban environment on well-being. An individual with a higher gross annual household income is more likely to choose higher willingness-to-pay categories for the tourist tax, keeping other independent variables in the model constant. The negative causality between years of schooling and the value attributed to the landscape, even in a sample that is more educated than the population in the real world, leads us to the fact that, at the same time, people value the service, but consider that it must be the state that pays, which is a weakness of the adopted methodology.

2. Contribution of each essay to the thesis purposes

The CVM provides results based on what individuals believe, not necessarily on their real actions. This duality is both a strength (as it captures non-use value, eliciting preferences for goods and services not directly traded in the market, or in cases where a market exists, captures benefits beyond the market price) and a weakness (as doubts persist about whether consumers would exhibit the same level of willingness in a real context).

Therefore, the technique must be formulated cautiously to be considered valid. The primary purpose of this thesis was to analyse the validity of the CVM. The validity of a study is determined by how plausible the results are to be true. The methodology is valid if the applied technique produces accurate estimates and if the methodology is well executed. In this section, the use of behavioural and experimental economics in building a theoretically framed consumer preference model will be discussed.

As explained in detail in Chapter 4, the results of these studies are heavily influenced by the specific attributes of each object being evaluated. Consequently, while it is possible to determine the results from the experimental situation to reality for each object under evaluation, it does not imply that all objects within each domain of cultural activity adhere to these causative relationships.

2.1. Experimental and behavioural economics to analyse the presence of biases in eliciting the value of cultural activities

The most significant criticisms of the CVM are related to potential biases it might introduce (Ajzen *et al.*, 1996; Snowball, 2008; Bedate *et al.*, 2009). The fundamental principle for validating the consumer preference model is individuals' reveal preferences in a hypothetical scenario as close to what they would do in a real context.

Hypothetical bias arises from the risk that results obtained in a social laboratory may not align with real-world responses (Yung and Chan, 2015; Barrio *et al.*, 2012). First, familiarity with the object helps reduce this bias (Mitchell & Carson, 1989). Additionally, the two surveys conducted minimized this risk through a preliminary questionnaire distributed among a small number of people. In the test questionnaire, open-ended questions were included for individuals to share their feelings, allowing an evaluation of the understanding of affinity, socioeconomic questions, and the hypothetical scenario. Changes were made to the survey, primarily focusing on clear and direct sentences. Additionally, the hypothetical scenario was presented only to those who expressed a positive or potentially positive WTP (including the introduction of "maybe," in addition to "yes"). This issue of evaluating WTP always comes after a set of relevant information about the service, framed in an economic rationality context, where there are numerous needs for a limited budget. One way to correct this bias involves introducing the level of certainty regarding the bid (Li & Mattsson, 1995; Welsh & Poe, 1998; Alberini *et al.*, 2003; Herrero *et al.*, 2012). In Chapter 3, in addition to introducing "maybe," which increases the number of individuals answering to WTP, we add a question evaluating the level of certainty of the last answer, excluding responses marked by uncertainty. In this way, the level of uncertainty prevents the possibility of excluding bids from individuals who view the provision of the service with indifference. Finally, another way to correct this bias is through the application of the dissonance minimizing technique, including questions regarding the importance/indifference/insignificance of the good without quantifying it (Aabø, 2005; Morrison & Dowell, 2015). In previous chapters, as described in the methodology, individuals faced several questions regarding affinity for cultural goods and services, on the one hand, but also specifically regarding the service under evaluation, on the other hand, contributing to mitigating hypothetical bias.

Strategic bias involves responding to achieve a goal rather than in line with the behaviour one would have in a real market situation (Giannakopoulou *et al.*, 2011; Bedate et *al.*, 2011; Báez-Montenegro *et al.*, 2012). This bias is closely related to the risk of individuals responding based on their feelings

about the exercise to assign more (or less) value to a good they consider particularly (or insignificantly) important, regardless of their budgetary constraints and objective capacity to allocate that monetary amount in a real market. As proposed by Sharifi-Tehrani *et al.* (2013), the questionnaire begins with the information that the exercise is for academic purposes. In fact, in none of the chapters are high willingness-to-pay responses obtained, neither on average nor in median terms, indicating an appropriate interpretation of the circumstance and the context in which the service is offered.

Starting-point bias means individuals might be influenced by the range of values available in the elicitation method or by the initial question itself (Mwebaze & Jeff Bennett, 2012). The payment card, used as the elicitation method in Chapter 2, required the individual to select each bid until the last one where there was WTP, and it presented an extended scale consistent with the market situation. In Chapter 3, with the DBDC elicitation method, a preliminary question was introduced to select the first question so that the individual could respond freely to their WTP in this, and the following question conditioned by the response to the previous question. This introduction minimizes scale-related bias as this scale is selected by the individual. In Chapter 4, various bids of the MBDC appear in random order to prevent individuals from favouring amounts based on the order of the list. The choice of elicitation method also proves crucial in obtaining reliable results. Although the open-ended question is straightforward to manage, it is not suitable for public goods because it favours strategic bias, namely an unrealistic response that allows free riding. On the other hand, the bidding game, although a technique that allows reflection on whether one would pay that amount because it requires a yes or no response for each, favours starting-point bias and high responses (Mitchell & Carson, 1989; Alberini *et al.*, 2003). The payment card simultaneously avoids all these previous problems and was chosen as the elicitation method in Chapter 2, ensuring the existence of a sufficiently large scale of bids available so that there is no bias related to this availability, and the available information minimizes strategic bias. Literature has also noted the advantages of the dichotomous choice (Bateman *et al.*, 2001; Vossler *et al.*, 2003), particularly the DBDC (Chapter 3) and MBDC (Chapter 4). While the first was used to incorporate uncertainty with the aim of improving the effectiveness of this technique, the latter contributed to its validation as a suitable methodology for eliciting consumer preferences since it has the advantage of directly incorporating individuals' uncertainty, increasing the rationality of choice. In non-market services, probably it is the first time who individuals are confronted with this reflection and there is no absolute certainty about what the WTP is, but that it will be close to a certain value. This level of

certainty, which directly includes the willingness-to-pay question ("definitely yes" and "probably yes"), excluded the intermediate point, forcing the individual to reflect under these conditions whether, with that bid, they would be in conditions probably more or less favourable to pay.

Information bias results precisely from the influence that the survey text has on the individual (Arrow *et al.*, 1993; Ajzen *et al.*, 1996; Fujiwara *et al.*, 2019). In both questionnaires, the scenario description was neutral and direct, stating that a certain amount of quantity was offered, as well as the actual cost associated with it. There is a generalization of willingness-to-pay results for a service through an embedding effect, which was also minimized by emphasizing what is specifically in evaluation. The weight of individuals willing to pay more in each of the questionnaires is at an acceptable level, and the justifications for not doing so do not indicate a lack of information about the object under evaluation. In Chapter 2, regarding the ticket price for access to a concert, 74 out of 211 individuals expressed unwillingness to pay more, a number that decreases to 62 in the case of the donation for the educational service. In Chapter 4, 100 out of 386 individuals provided justifications for an unwillingness to pay more for the tourist tax.

Payment vehicle bias occurs due to unfamiliarity or lack of adherence to the hypothetical market formed. In Chapter 2, only 2.70% of individuals who are not willing to pay more for a concert stated that this is an inappropriate payment vehicle, a percentage that rises to 6.45% regarding the donation. In addition, in Chapter 4, only 5.00% of individuals who are not willing to pay more for the tourist tax consider it is an inappropriate payment vehicle. Thus, these numbers validate the chosen means of payment. Additionally, it was stated that the payment was per concert, pertaining to the donation and ticket access, while the tourist tax was per night and per person, payment vehicles that are familiar in these terms. The only payment vehicle that provided only a single donation was the crowdfunding campaign, as this financing methodology typically works in this manner.

2.2. Consistency between preferences elicited on an ordinal scale and preferences elicited on a ratio scale

Utility can be derived from the assumption that individuals can assign a value of use to each quantity of goods or services consumed. While cardinal utility corresponds to the sum of the utility derived from individual consumption, ordinal utility consists of the ordering of preferences, assigning a numerical value to each quantity consumed so that preferred options have a higher

number than less preferred ones (Varian, 1992). When the same conclusions can be achieved with ordinary utility, which is based on weaker assumptions than cardinal utility, then the theory has advantages (Salvatore, 2003).

A consumer's preference order is the list of satisfaction derived from consuming a service in order of preference, described in an ordered manner (Andersson & John Armbrecht, 2014). In the survey, preferences were expressed in cardinal form with numerical bids, where the individual indicated their WTP for a certain amount of service under the described conditions. Nevertheless, the econometric treatment of the data often led to ordinal scale models due to the nature of the elicitation method, on the one hand, and to introduce the level of uncertainty, on the other. Additionally, the use of ordinal scale variables was crucial in achieving the presented results, particularly in Chapter 2, where one of the explanatory variables of the model assumes this nature (the scale of values assigned to the service).

First, in terms of econometric treatment, models with ordinal categories as the dependent variable were utilized in two out of three essays. In Chapter 2, the treatment of the payment card elicitation method initially involved adjusting the data to the econometric interval regression method, as it allows a simple interpretation of the coefficients associated with the explanatory variables. However, by transforming the model into dependent variables that form a range of values, it is essential to examine the validity of linearity concerning economic theory. Indeed, as the distance between the options of the dependent variable becomes irrelevant, there is no need for the model to comply with this condition required for linear regressions. In this sense, and considering the database, the results were compared between the interval regression model and the ordered probit model, as mentioned in the preceding subchapter. The ordered probit model proves to be theoretically suitable because, on one hand, the characteristics of the explained variable – natural ordering and the presence of an unobservable latent variable – and, on the other hand, the assumption that errors follow a normal distribution can be adjusted to the model. There is a remarkable coherence between the results obtained by the interval regression model and the ordered probit model, namely: a positive and statistically significant coefficient associated with the gender variable, a positive and statistically significant coefficient for the logarithmic variable of the household's gross income, a positive and statistically significant coefficient associated with the frequency of performing arts shows, and a negative and statistically significant coefficient regarding aesthetic value and option value. However, after conducting tests to evaluate the most suitable model, it became evident that the latter would be more suitable to the data.

In Chapter 4, the cardinal bids were transformed into ordinal preferences due to the introduction of the level of certainty (or the treatment of the uncertainty level of responses). The treatment of the MBDC elicitation payment vehicle was also done econometrically by a non-linear ordered model because, as in the previous case, there is a natural order in willingness-to-pay decisions, even with the introduction of certainty levels. Non-linear ordinal models allow obtaining estimators that consider the treatment of uncertainty. It is important to underline that uncertainty regarding bids leads to invalid results. The theoretical model intended to construct a set of categories, where in each category, there were likely or definitely certain answers for a given bid. In essence, an interval of values was created based on the self-declared certainty level of the bids. The implication that this might be the first time the individual confronts the reflection on the value of the cultural landscape object justifies the adoption of this cautious technique. It is more likely, in this case, that the real value lies within an interval of values (Welsh & Poe, 1998; Evans *et al.*, 2003). The validation of the multiple-bound discrete choice, using the ordered generalized logistic model, as a suitable elicitation methodology in the context of hypothetical experience valuation, is an essential contribution to an analysis of the results considering what would happen in a real market.

In Chapter 2, the consumer preference model introduced a set of independent variables of ordinal scale, where individuals ranked, in decreasing order of importance, each of the values assigned to the evaluation service. The average value assigned to each type of value was calculated, with some of these variables being statistically significant in explaining a favourable response to a potential desire to pay more for the service. Considering the legacy, social, existence, aesthetic, touristic, option, and belonging values, it is concluded that the satisfaction derived from its function of conserving classical music by resident musical groups and the utility derived from Casa da Música as an identity asset of the region establish a causal relationship that explains a favourable or unfavourable response regarding the WTP more for a concert.

2.3. Empirical contribution to the development of a consumer preferences model for application in cultural activities provision and consumption decisions

The theory of stated preferences is believed to have originated in the 1920s when Thurstone developed a binary choice model with judgments on an interval scale to measure the impact of attitudes on religion. However, it was not until the 1940s that economists began using surveys to analyse consumer behaviour (Brown, 2003).

Based on the surveys described earlier and considering the specified concerns, individual consumer preference models were constructed. What determines the consumption of a quantity of goods or services depends on a set of characteristics that lead to the creation of consumption behaviour models. The following table summarizes the consumer preference models for each of the evaluated markets.

Table 31. Overview of consumer preference models

Market	
Performative arts (Chapter 2)	
Concert	$WTP = f[Gender\ (+),\quad Log(Income)\ (+),\ Schooling\ (-),\ Performative\ arts\ (+),\ Household\ (-),\ Aesthetical\ value(+), Option\ value\ (+)]$
Educational service	$WTP = f[Gender\ (+),\quad Log(Income)\ (+),\quad Schooling\ (-),\ Perfromative\ arts\ (+),\quad Children\ (+),\ Social\ value\ (+)]$
Cultural landscape	
Chapter 3	$WTP = f[Gender\ (+),\quad Income\ (+),\quad Schooling\ (-),\ Ideology\ (+),\ Landscape\ (-),\ Conservation\ (+)]$
Chapter 4	$WTP = f[Age\ (-),\quad Log(Income)(+),\quad Schooling\ (-),\ Gender\ (+),\quad Environment\ (+),\ Landscape\ (-)]$

Source: own elaboration

According to the results obtained in Chapter 2, it is concluded that the male gender of the individual, the annual income of the household, the regular frequency of concerts, the aesthetic value, and the option value individually have a favourable effect on the WTP for a concert ticket. Regarding the educational service, the WTP more for a donation depends on gender (male), annual household income, frequency of performing arts events, attributed to social value, and the presence of children in the household. Education, although statistically significant, also has a negative effect. As the econometric model used was the ordered probit one, the reference to a positive or negative effect means that the probability of the individual choosing categories where the bids are higher or lower, respectively, all else being constant. However, it can be simplistically stated that there is a positive or negative effect determining the WTP. The residential city of the individual and income of the household present expected results concerning the literature (Snowball, 2005; Srakar & Vecco, 2017). Conversely, the preference for performing arts is higher among female individuals and those more qualified (Seaman, 2005; Anderson & Armbrecht, 2014).

In Chapter 3, preferences for a cultural landscape depend on gender (male), higher levels of annual gross income, more left-wing political ideology, and positive importance attributed to the preservation of the natural landscape. Stated preferences by individuals with higher income are consistent with existing literature (Dutta *et al.*, 2007; Báez-Montenegro *et al.*, 2012). The same does not happen regarding education, which has a negative effect on WTP for a donation for the conservation of the cultural landscape (Del Saz-Salazar & Garcia-Menendez, 2003; Kim *et al.*, 2007; Verbic & Slabe-Erker, 2009; Verbic *et al.*, 2016). The positive impact of the importance attributed to the natural landscape is consistent with existing studies (Dutta *et al.*, 2007; Verbic *et al.*, 2016).

Alternatively, stated preferences by individuals regarding the cultural landscape are higher among younger or less qualified individuals, all else being constant, which is inconsistent with existing literature (Do Valle *et al.*, 2012; López-Sánchez & Pulido-Fernández, 2017; Rotaris & Carrozzo, 2019), and among individuals with higher income, which is in line with scientific evidence (Borges *et al.*, 2019). Stated preferences by individuals regarding the cultural landscape are lower when they positively evaluate the impact of the urban landscape on well-being and more negatively assess the impact of tree cover on quality of life.

3. Public intervention

In a competitive market with many consumers and producers, Pareto equilibrium, price and quantity transacted, where no one can be made better off without making someone else worse off (Frank & Bernanke, 2001). However, market failures are common due to a lack of competition, incomplete information, or absence of markets, leading to inefficiencies that delay the maximization of social welfare (Varian, 1992; Mas-Colell *et al.*, 1995). In the economics of culture, the existence of public goods and the presence of externalities justify public intervention (Heilbrun & Gray, 2001; Towse, 2010).

The provision of public goods is precisely related to a market failure, forcing their provision to be partially or entirely financed. However, not all cultural goods and services can be considered public goods because their access can be restricted, either due to capacity constraints (auditorium seating) or pricing. Therefore, there is another justification for public funding related to correcting externalities (Frey, 2003).

The theory of rationality assumes that individuals derive satisfaction from normal goods and other goods whose satisfaction depends on past consumption (Becker & Murphy, 1988). This can justify subsidies to the production of certain goods or services to lower market prices, allowing more consumers to access the goods. Even when there are no externalities (benefits to the community), but only the individual derives utility from consuming a certain quantity of a good, state paternalism can determine that the advantages of that good justify its funding (Towse, 2010).

In addition to other businesses where products result from the combination of labour, capital, and technology, concerts or any other activity promoted by performing arts entities are services offered by an economic agent (Throsby, 1994). In this way, the use of non-market techniques is beneficial in analysing public intervention to achieve equity in the provision of public services. This technique, associating value with hypothetical prices, allows the analysis of the price elasticity for services and thus determining the level of exclusion of citizens from service provision. There is typically a relatively low price elasticity in performing arts due to the small market size and few or no substitutes, such as in the case of a large orchestra where the price is practically inelastic regarding demand (Seaman, 2006). However, there is a distinction between production in terms of installed capacity during a specific period and the number of people definitively paying to attend the concert. Therefore, as there is an installed capacity (number of available seats in the auditorium), this good may not meet the criteria of a pure public good due to this installed capacity (Throsby, 1994).

This study emphasizes the importance of public funding to ensure that a facility promoting live performances has a ticket price compatible with its public service mission and an agenda that promotes the creation of consumption habits in an activity where lagged demand had importance to present demand. According to the institution's financial report, the cost of each regular performance averaged €74.4, but the amount consumers are willing to pay is €22.30 (€11.8 from the average ticket price, plus €10.5 from the WTP more to attend a concert). In the absence of state intervention, there would be significant exclusion of users who already frequent the facility today. This exclusion would have an even more significant impact, in terms of public service optimization, for those who might still attend, where educational services play a significant role since, as discussed earlier, past consumption has a positive and statistically significant impact on consumer preferences. With a subsidy equal to the external benefit generated by the activity in society, the market equilibrium will be more efficient than before public intervention (Frank & Bernanke, 2001). However, to avoid government failure, public intervention must ensure that the cooperation agreement with the private entity has the right incentives to maximize cultural policy objectives (Towse, 2011). Agency theory states that one entity (in this case, the state) formally commits to another entity (the agent, the private economic agent) to perform a service that would be the state's responsibility. It is possible to protect the contract with a set of incentives if they contribute to enhancing the agent's efficiency in achieving the objectives underlying the establishment of the partnership (Laffont & Tirole, 1993).

While in private goods, the benefits are exclusively for those who produce and consume that goods and services, in public goods, the benefits are not exclusive, and an individual's satisfaction with these benefits does not harm or exclude the benefit of another person (Brooks, 2006; Snowball, 2008). This means that no one can be excluded from the benefits of maintaining and conserving the cultural landscape, as at the same time, no one can be excluded from consuming, and their consumption does not reduce the quantity available for a third individual (Verbic *et al.*, 2016). Although there is no defined market, there is a value that can contribute to the increased well-being of individuals (Del Saz-Salazar & Garcia-Menendez, 2003).

In this respect, this study analysed two distinct perspectives: i) measure the total value of the cultural landscape after requalification, which included accessibility, leisure spaces, public art, playgrounds, and gardens; and ii) drivers of acceptability of a fiscal instrument to address resources to conservation and maintenance of the cultural landscape. In this regard, public intervention is

very broad because, on one hand, it has the competence of heritage classification, an important instrument for safeguarding privately owned buildings; on the other hand, it has the function of maintenance and conservation of the own domain, including public spaces. The Cordoaria district is a great example. First, the state classified a set of properties with historical and heritage interest. Secondly, with the UNESCO World Heritage designation, this protection for a social and cultural ensemble was enhanced. Thirdly, with the recognition of the European Capital of Culture organization, the local authority mobilized resources for urban and landscape requalification that privileged the relationship of citizens with the place. The contribution from a crowdfunding campaign promoting the preservation of this cultural landscape reveals the importance individuals attribute to the ensemble. Moreover, even non-residents are willing to pay a tourist tax higher than the one currently employed in the city if it ensures adequate maintenance. If this tourist tax covers the external cost, then the market equilibrium will be more efficient than it would be before public intervention (Frank & Bernanke, 2001). The quantification of the external cost (negative externality) is not relevant for this study because the objective was to use this payment vehicle as a familiar and appropriate way to measure cultural landscape value.

4. Future research

Given the persistent challenges associated with CVMs, it is imperative to investigate innovative approaches that address the limitations of existing techniques. The validation of this methodology is a crucial step in this objective. Beyond its scientific impact, the results have implications for decision-making, and the expectation is that they will contribute to a better understanding for all stakeholders operating in this market.

Nevertheless, the limitations persist in the application of stated preference methodology. For this reason, and since, from a scheduling standpoint, it was not possible to conduct the study concerning the object National Museum Soares dos Reis, it is considered relevant not only because it deals with a distinct purpose (consumer preferences for museum services) with unique characteristics but also because the goal was the validation of a technique to correct the potential hypothetical bias of the results. Evaluating the presence of hypothetical bias can be done through experimental methodology by conducting a real version of a questionnaire for a small sample to estimate the statistical function of hypothetical bias (Blackburn *et al.*, 1994; Botelho & Pinto, 2002).

Regarding consumer preferences for performing arts and considering the concerning conclusions from the perspective of developing preferences through learning-by-consuming, it would be important to understand the situation after a period of regular agenda. The central question to investigate would be the changes in consumption habits of services promoted by entities that promote performing arts that consumers still reveal to understand if individuals have returned to assign the same level of value they did before the outbreak of the pandemic considering the set of transformations occurring in society, largely accelerated by this historical period, which necessarily impacts consumers' individual utility, either through changes in preferences or changes occurring in the provision of services. For this reason, an important question that needs to be addressed is whether, on the supply side, institutions have also altered their behaviour, particularly in digitization, governance model, risk management, programming, and communication. One of the weaknesses in Chapter 2 is the sample size, and future research should allocate resources to obtain a larger population so that the adopted methodology is not restricted by the scarce number of observations. Finally, the questionnaire developed did not focus on the specificities of the services offered, particularly the quality of concerts and recommendation mechanisms. The value creation process involves the interaction between individuals and the impact of critics, who can influence the price (Angelini & Castellani, 2019). These referencing characteristics, although not new in the literature, may lead to new conclusions regarding the specific object since a substantial part of its regular agenda results from classical music.

In relation to the landscape, as mentioned in the methodological description, the sample consists only of residents in Portugal. This option was a way to minimize the risk of biasing individuals by expressing preferences for an object they would not expect to quantify, and simultaneously, this object being unfamiliar. Future research, particularly regarding the impact of the tourist tax on landscape preservation, should expand the sample to non-residents, contrasting the coherence between the preferences of both groups.

In recent times, due to criticisms regarding the validity and reliability of results obtained with the CVM, new methodological developments have emerged regarding the valuation of cultural goods and services. Klamer (2016) considers that there is individual value associated with the benefits the worker gains from it and a social value, which is the contribution that results from his work contributes to the community, creating the value-based approach, which aims to bring both dimensions closer. There is a cultural valuation process from one to the other, where individuals evaluate artistic attributes. While stated preference techniques focus on the outcome, financially

speaking, this approach, resulting from deep criticism of the research that has been conducted, focuses not on the consumer but on the characteristics of the provision of cultural goods and services, resulting in the creation of externalities. In other words, "the challenge to theatre makers and museums is not so much selling tickets but getting others willing to contribute and participate" (Klamer, 2016: 372).

The ongoing debate in the scientific community regarding the value of goods and services shows how this continues to be a significant topic for future research. Seaman (2006) states that cultural value can only be expressed by those who possess a level of accumulated cultural or educational capital. Focusing precisely on this aspect, procedures have been developed to calculate the size of externalities caused by the accumulated capital of higher education levels (Bell *et al.*, 2022). Similarly, the aggregated effect of consuming cultural goods and services will have a positive impact on the community, which could constitute an alternative valuation of the effect of the caused externality instead of stated preferences methodologies.

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Appendices A

Autor(s)	Country	Field	Object	Sample	Survey approach	Elicitation method	Vehicle of payment	Model
Aabø (2005)	Norway	Library	Municipal Public Libraries	999	Face-to-face	Payment card; multiple bounded discrete choice (MBDC) and dissonance minimizing (DM);	Budget funds	Logistic regression (DC) / Linear multivariate regression (MBDC);
Andersson & Lundberg (2013)	Sweden	Festival	Music Festival (Gothenburg, Sweden)	648	Online	Open-ended	Taxes	-
Andersson & Armbrecht (2014)	Sweden	Festival	Way Out West (Gothenburg)	714	Online	Open-ended	Various	OLS
Andersson *et al.* (2017)	Sweden	Festival	Musical Festival (Gothenburg)	719 (festival users) 648 (city)	Online	Open ended	Taxes	-
Srakar, A & Vecco, M. (2017)	Slovenia	Festival	European Capital of Culture	616	Telephone	DBDC	Admission fee	Bivariate probit
Armbrecht. (2014)	Finland	Performative Arts/ Museum	Vara Konserthus/ NordicWatercolour Museum	583 (Konserthus) 414 (Museum)	Online	Open-ended	Admission fee	-
Báez (2012)	Chile	Historical site	Valdivia	615	Face-to-face	DBDC	Ticket for the guided walking tour	-
Báez *et al.* (2012)	Chile	Historical site	Valdivia	865	Face-to-face	DBDC	Annual donation	Bivariate probit
Báez-Montenegro *et al.* (2012)	Chile	Historical site	City of Valdivia	865	Face-to-face	DBDC	Donation	Bivariate probit
Bedate *et al.* (2009)	Spain	Museum	Museo Patio Herreriano de Arte	485 (Survey 1) + 437 (Survey 2) / 588	Face-to-face	DBDC	Annual voluntary donation	-

Autor(s)	Country	Field	Object	Sample	Survey approach	Elicitation method	Vehicle of payment	Model
			Contemporáneo Español (Valadollid)	(Valladolid residents) / 287 (ARCO)				
Bedate *et al.* (2012)	Spain	Museum	Museo Patio Herreriano de Arte Contemporaneo (Valladolid)	1251 (prior opening) / 1025 (after opening)	Face-to-face	DBDC	Annual donation	-
Del Saz-Salazar & Garcia-Menendez (2003)	Spain	Historical site	Requalification of the Castellón Port Area	562	Face-to-face	DC	Donation	Logit
Delaney & O'Toole (2006b)	Ireland	Broadcasting	RTE - Irish Public Broadcasting	1000	Telephone	Bidding game	Month fee	Tobit and Logit
Delaney & O'Toole (2006a)	Ireland	Broadcasting	RTE - Irish Public Broadcasting	807	Telephone	Bidding game	Monthly fee	-
Duttaa et al. (2007)	India	Heritage	Prinsep Ghat, Calcutta	203	face-to-face	Bidding game	Voluntary donation	Tobit
Fujiwara *et al.* (2019)	England	Library	National Library	2000	Online	Payment card	local tax	OLS, Heckman and Ordered probit
Giannakopoulou and Kaliampakos (2016)	Greece	Landscape	Sirako	1340	Face-to-face	Open-ended	Donation	-
Giannakopoulou and Kaliampakos (2016)	Greece	Historical site	Sirako	175 (residents) / 240 (non-residents)	Face-to-face	Open-ended	Voluntary donation	OLS
Giannakopoulou *et al.* (2011)	Greece	Landscape	Vernacular architecture (Metsovo)	310	Online	Open-ended and DC	Voluntary donation	Logit
Gražulevičiūtė-Vileniškė *et al.* (2011)	Lithuania	Historical site	Raudondvaris manor and Kaunas regional manors	179	Postal	DC	Voluntary donation and one-time payment	Logit

Autor(s)	Country	Field	Object	Sample	Survey approach	Elicitation method	Vehicle of payment	Model
Herrero *et al.* (2012)	Spain	Festival	Classical Music Festival (Santiago de Compostela)	825	Face-to-face	Bidding game	Admission fee	-
Jackson *et al.* (2014)	Sweden	Sports	Sports event	650	Online	Open-ended	Expenditure	OLS
Kima *et al.* (2007)	Korea	Heritage	Changdeok Palace	442	Face-to-face	DC	Admission fee	Log-linear and log-logit models
Kuhfuss *et al.* (2016)	Scotland	Heritage	Calanais Stone Circle, Kilchurn Castle, St AndrewsCathedral, Aberlemno stone cross, Maclellan's castle and Mousa Broch.	1628	Face-to-face	Payment cards and open-ended	Income taxes	Tobit
Lin *et al.* (2013)	Taiwan	Broadcasting	Public Television Service (Taiwan)	376	Telephone	Bidding game	Annual fee	Probit
Mazadiego *et al.* (2019)	Spain	Heritage	Extremadura Mining	202	Online	Referendum	Admission fee	-
Sharifi-Tehrani *et al.* (2013)	Iran	Museum	National Museum of Iran	560 (354 residents and 206 non-residents)	Face-to-face	Open-ended	Admission fee	OLS
Morrison & Dowell (2015)	Australia	Others	Various	346	Face-to-face	Referendum	Admission fee	Binary logit
Munley (2018)	Ireland	Museum	Galway City Museum	833 surveys	Face-to-face	DC	Admission fee	OLS and probit
Mwebaze & Bennett (2012)	Australia	Others	Botanic Garden	1139	Face-to-face	DC	Admission fee	Logit model
Revollo-Fernández (2015)	Mexico	Landscape	Xochimilco	810 surveys (700 national surveys and 110 international surveys)	Face-to-face	Open-ended	Donation	Logit model

Autor(s)	Country	Field	Object	Sample	Survey approach	Elicitation method	Vehicle of payment	Model
Salazar & Marques (2005)	Spain	Heritage	restoration of an old Arab tower (Valencia)	252	Face-to-face	DC	Donation	Logit regression model and Tobit
Sanz *et al.* (2003)	Spain	Museum	National Museum of Sculpture (Valladolid)	Use-value: 1108 / Passive use value: 1014	Telephone	DC	Donation	nonparametric algorithm of An and Ayala
Sattouta et al. (2007)	Lebanon	Landscape	Cedar forests	416	Face-to-face	Open-ended	Municipal bills	stepwise multiple linear regression
Snowball, J (2005)	South Africa	Festival	Art festival	279	Telephone	DC	Taxes	Logit and Tobit
Srakar, A. & Vecc, M. (2017)	Slovenia	Festival	Maribor European Capital	143	-	-	-	-
Stevenson, D. (2013)	Scotland	Museum	National Galleries of Scotland	222 (users) 78 (non-users)	Online and face-to-face	Payment card	Admission fee	-
Tuan & Navrud (2007)	Vietnam	Heritage	My Son World Heritage	930	Face-to-face	DC	Admission fee	Binary Logit
Tuan & Navrud (2008)	Vietnam	Heritage	My Son World Heritage	245 (users), 238 (non-users)	Face-to-face	Bidding game	Admission fee	Binary Logit
Tuan *et al.* (2009)	Thailand ; Vietnam	Heritage	Historical temples in the central region of Thailand / My Son world heritage site of Vietnam	Thailand: 520 individuals / Vietnam: 241 individuals	Face-to-face	DC	Supplement on income tax and voluntary donation	Logit
Verbič & Slabe-Erker (2009)	Slovenia	Historical site	Volcji Potock Protected Area	312	Face-to-face	DBDC	Land use rate	bivariate probit
Verbič *et al.* (2016)	Slovenia	Historical site	Riverside of Ljubljana	278	Face-to-face	DBDC	Property tax (residents) and fee (non-residents)	bivariate probit

Autor(s)	Country	Field	Object	Sample	Survey approach	Elicitation method	Vehicle of payment	Model
Yung & Chan (2015)	China	Historical site	Central Police Station (Hong Kong)	256	Face-to-face	Payment-card	% individual's income tax and a fixed monthly amount paid to the government for two years	Ordinal data regression model

Source: own elaboration

Appendices B

Complementary material from Chapter 2

This questionnaire is part of the joint doctoral program in economics of the University of Minho and Coimbra.

The objective is to analyse the formation of individual preferences regarding Casa da Música Foundation and the services it provides.

The purpose of this study is scientific, and the information will be treated only in an aggregated manner, without individual specification, ensuring compliance with the legislation provided in the General Data Protection Regulation 2016/679.

The survey takes approximately 12 minutes. Any questions can be clarified by contacting personalemail@gmail.com. Thank you for your cooperation.

Q1. Considering only your opinion, and knowing there are no right or wrong answers, please evaluate the following statements.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
The consumption of cultural goods and services increases consumer well-being.					
Access to cultural facilities contributes to children's development.					
Preservation of natural landscapes enhances the well-being of populations.					
Preservation of urban landscapes enhances the well-being of populations.					

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Cultural facilities have value even for those who do not frequent them.					
Public funding for culture should be a top priority in the State Budget.					
Preservation of cultural goods and services is relevant for the country.					

Q2. According to the Eurostat Cultural Statistics Guide (2018) and considering the Classification of Individual Consumption by Purpose (COICOP), the cultural goods and services considered for calculating total household expenditure are as follows:

- Equipment for receiving, recording, and reproducing sound and images;
- Photographic and cinematographic equipment and optical instruments;
- Computer equipment;
- Pre-recorded recording media;
- Repair of audiovisual, photographic, and computer equipment;
- Musical instruments;
- Cultural services (museums, concerts, and other performances, including TV or video-on-demand subscriptions); and,
- Books; and Newspapers.

What was your household's annual expenditure in euros on cultural goods and services?
In 2019
In 2020

Q3. During 2019, considering your cultural experiences, select the option that best represents the reality regarding each of the following cultural practices.

	Up to 3 times	At least 3 times	Never
Did you go to the cinema?			
Did you attend a live performance?			
Up to 3 times At least 3 times Never			
Did you visit a museum or monument?			
Did you have regular leisure activities (other cultural activities such as reading, watching TV, or video-on-demand)?			

Q4. Considering the response to the previous question, select the option that best justifies the lower frequency of one or more cultural practices.
No disposable income
No available offerings
Lack of interest
Other:

Q5. During 2020, considering any changes due to the Covid-19 pandemic, select the option that best represents the reality regarding each of the following cultural practices.

	Yes	No
Did you visit museums or monuments less frequently?		
Did you attend live performances less often?		
Did you go to the cinema less frequently?		
Did you spend less time on regular leisure activities (other cultural activities such as reading, watching TV, or video-on-demand)?		

Q6. Considering the response to the previous question, select the option that best justifies the lower frequency of at least one of the previous practices.
Changes in confidence level (fear of contagion)
Changes in offerings (schedule configurations and diversity of available services)
Changes in income
Changes in personal availability
Other:

Q7. Casa da Música Foundation is a private-law institution of public utility, located in Porto, whose purpose is the promotion, development, dissemination, and pursuit of cultural and educational activities in the field of music through a concert hall with resident musical groups and an educational service that aims at community involvement, social integration, music education, and audience expansion.

Q8. Rank the following services provided by Casa da Música Foundation according to their importance to you. Drag and move each option, assuming 1 as least important and 7 as most important.

Satisfaction derived from its role in the conservation of classical music by resident musical groups.
Satisfaction derived from the existence and programming of Casa da Música's educational service available to all.
Satisfaction derived from the mere existence of Casa da Música even if not attended.
Satisfaction derived from the opportunity to attend concerts in the auditoriums.
Satisfaction derived from guided tours and architectural features of Casa da Música.

Satisfaction derived from maintaining activity even when there is little demand.
Satisfaction derived from Casa da Música's assertion as an identity asset of the region.

Q9. Referring to the year 2019, select the option that best represents the reality.

	Up to 3 times	At least 3 times	Never
How many times did you attend a concert at Casa da Música?			
How many times did you participate in an initiative of Casa da Música's educational service?			

Q10. How do you usually attend events at Casa da Música?
Alone
With family
In groups
With partner
With friends
I never go

Casa da Música has resident musical groups, including the Casa da Música Symphony Orchestra, the Casa da Música Choir, the Remix Ensemble, and the Baroque Orchestra. In 2019, 116 concerts were held, involving 63,404 spectators. The cost of each show was 74.4 € while the average ticket price did not exceed 11.8 €. The cost of each show is thus 6 times higher than the ticket price, on average.

Q11. Considering that the cost of each show, per person, on average, is 6 times higher than the ticket price at Casa da Música, and considering your household income and usual expenses, would you be willing to pay a higher price than currently practiced for a concert ticket?
Yes
No
Maybe

Q12. Among the following options, what is the justification that best supports your previous answer?
I do not have more disposable income
I consider the current price too high
The Government should assume this financing responsibility
I do not consider this a suitable mean of payment for accessing this service
Other: _____

Q13. How much more would you be willing to pay to attend a concert? Select each amount you are willing to pay until reaching the maximum value.

€2.5 €5 €7.5 €10 €12.5 €15 €17.5 €20 €22.5 €25 €27.5 €30

Q14. Considering the importance of educational projects in social integration, academic deepening, and audience expansion, and that their funding also comes from concert revenues, would you be willing to donate beyond the ticket price to finance the educational projects of the Foundation?

Yes

No

Maybe

Q15. Among the following options, what is the justification that best supports your previous answer?

I do not have more disposable income

I consider the current price too high

The Government should assume this financing responsibility

I do not consider this a suitable mean of payment for this service availability

Other: _____

Q16. Considering your income and usual expenses, indicate the amount of the donation you would be willing to offer when purchasing a concert ticket. Select each amount you are willing to pay until reaching the maximum value.

€2.5 €5 €7.5 €10 €12.5 €15 €17.5 €20 €22.5 €25 €27.5 €30

The following video provides a guided tour of the Casa da Música headquarters building.

Q17. The infrastructure designed by Rem Koolhaas, housing the headquarters of Casa da Música Foundation, has distinctive features from an aesthetic, acoustic, and recreational point of view. Until the European Capital of Culture Porto 2001, there was no such performance venue, and concerts were held in other existing venues in the city, as it still happens today. How relevant do you consider the Casa da Música building?

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I consider that the infrastructure is coherent with the surroundings.					
Casa da Música building is a symbol of the city.					

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
There is a need for this infrastructure for diversifying the offer.					
Existing performance venues are not sufficient.					
I would prefer the funds invested in this infrastructure to be used for cultural programming.					

Q18. Considering the emergence of the pandemic, has your willingness to pay for a concert ticket increased during this period?
Yes
No
Maybe

Q19. Among the following options, what is the justification that best supports your previous answer?
My disposable income has changed.
My consumption habits have not changed.
I consider the price I am willing to pay is already sufficient.
My willingness to pay has decreased.
Other: _____

Q20. How much more would you be willing to pay to attend a concert? Select each amount you are willing to pay until reaching the maximum value.

€2.5 €5 €7.5 €10 €12.5 €15 €17.5 €20 €22.5 €25 €27.5 €30

Q21. Gender:
Male
Female

Q22. Age:

Q23. Marital Status:
Single

Married
Cohabiting
Divorced
Widowed

Q24. How many individuals are there in your household, including yourself?

Q25 What is your household's gross annual income in euros?

Q26. What is your level of education?

Up to the 2nd cycle of basic education

Completed the 3rd cycle of basic education

Completed secondary education

Bachelor's degree

Master's or Postgraduate degree

Doctorate or Postdoctoral degree

Q27. Are there one or more individuals under the age of 15 in your household?
Yes
No

Q28. On a scale from one to ten, where one is right-wing and ten is left-wing, indicate your political preference.

Q29. On a scale from one to five, where one is extremely poor and five is exceptionally good, indicate your health status.

Q30. What is your permanent residence town?

Appendices C

Complementary material from Chapter 3 and 4

This questionnaire is part of the joint Ph.D. program in economics at the University of Minho and Coimbra.

The objective is to analyse individual preferences regarding the urban landscape of Cordoaria, Porto, which was redeveloped during the European Capital of Culture event.

This study is for scientific purposes only, and the information will be treated in an aggregated form, ensuring compliance with the General Data Protection Regulation 2016/679.

The survey will take approximately 8 minutes to complete. For any inquiries, please contact personalemail@gmail.com.

Thank you for your cooperation.

Section I

Q1. Considering solely your opinion, and knowing there are no right or wrong answers, please evaluate the following statements.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
The consumption of cultural goods and services increases consumer well-being.					
Access to cultural facilities contributes to children's development.					
Preservation of natural landscapes enhances the well-being of populations.					

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Preservation of urban landscapes enhances the well-being of populations.					
Cultural facilities have value even for those who do not frequent them.					
Public funding for culture should be a top priority in the State Budget.					
Preservation of cultural goods and services is relevant for the country.					

Q2. According to the Eurostat Cultural Statistics Guide (2018) and considering the Classification of Individual Consumption by Purpose (COICOP), the cultural goods and services considered for calculating total household expenditure are as follows:

- Equipment for receiving, recording, and reproducing sound and images;
- Photographic and cinematographic equipment and optical instruments;
- Computer equipment;
- Pre-recorded recording media;
- Repair of audiovisual, photographic, and computer equipment;
- Musical instruments;
- Cultural services (museums, concerts, and other performances, including TV or video-on-demand subscriptions); and,
- Books; and Newspapers.

What was your household's annual expenditure in euros on cultural goods and services?

In 2019

In 2020

Q3. During 2019, considering your cultural experiences, select the option that best represents the reality regarding each of the following cultural practices.

	Up to 3 times	At least 3 times	Never
Did you go to the cinema?			
Did you attend a live performance?			

	Up to 3 times	At least 3 times	Never
Up to 3 times At least 3 times Never			
Did you visit a museum or monument?			
Did you have regular leisure activities (other cultural activities such as reading, watching TV, or video-on-demand)?			

Q4. Considering the response to the previous question, select the option that best justifies the lower frequency of one or more cultural practices.
No disposable income
No available offerings
Lack of interest
Other:

Q5. During 2020, considering any changes due to the Covid-19 pandemic, select the option that best represents the reality regarding each of the following cultural practices.

	Yes	No
Did you visit museums or monuments less frequently?		
Did you attend live performances less often?		
Did you go to the cinema less frequently?		
Did you spend less time on regular leisure activities (other cultural activities such as reading, watching TV, or video-on-demand)?		

Q6. Considering the response to the previous question, select the option that best justifies the lower frequency of at least one of the previous practices.
Changes in confidence level (fear of contagion)
Changes in offerings (schedule configurations and diversity of available services)
Changes in income
Changes in personal availability
Other:

Section II

Q7. Have you ever been in the Cordoaria area of Porto after the redevelopment done for Porto 2001 - European Capital of Culture?

Yes

No

Q8. Considering solely your opinion, and knowing there are no right or wrong answers, please evaluate the following statements.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Preserving this landscape has benefits for future generations.					
Preservation of natural landscapes enhances the well-being of populations.					
This urban landscape contributes to the conservation of cultural heritage.					
The public space in this area offers various leisure activity options.					
The tree line in Cordoaria contributes to absorbing city-emitted carbon emissions.					
The tree line in Cordoaria helps reduce summer temperatures and increase humidity.					
The mere existence of this landscape contributes to my well-being.					

Q9. The next set of questions depends on your permanent residence. The Metropolitan Area of Porto includes the municipalities of Arouca, Espinho, Gondomar, Maia, Matosinhos, Oliveira de Azeméis, Paredes, Porto, Póvoa de Varzim, Santa Maria da Feira, Santo Tirso, São João da Madeira, Trofa, Vale de Cambra, Valongo, Vila do Conde, and Vila Nova de Gaia. Do you have permanent residence in the Metropolitan Area of Porto?

Yes

No

The Cordoaria Garden features green areas, a playground, and several sculptures. The Porto City Council fund the maintenance of this facility. The tourist tax, worth two euros per night per person, contributes to environmental improvement and preservation in the city and for public domain improvements. Consider, hypothetically, that this tax is the sole funding source for the maintenance and conservation of the Cordoaria area. It is used for maintaining green areas, environmental awareness, cultural promotion, and other conservation activities, not for any other purpose. As this study aims to assess the value attributed to urban landscapes, the tourist tax can be used as an approximate variable for willingness to pay for Cordoaria's conservation.

Q10. Consider that the revenue from the tourist tax only funds the Cordoaria area, and without this funding, its maintenance cannot be adequately done. Considering your household income and usual expenses, would you be willing to pay more than two euros per night per person in tourist tax for accommodation in Porto?

Yes

No

Maybe

Q11. Among the following options, which reason best justifies your previous response?
No disposable income
The State should assume this responsibility
I do not consider this an appropriate mean of payment
Other:
I do not live in this region
This issue is not a priority
I am not available to pay more
I need more information/time to answer

Consider another hypothetical scenario where it is possible to build a building in the area surrounding Cordoaria Garden, according to the dominant height style in the neighbourhood. For illustrative purposes, according to the project, the following image demonstrates how the volume would be integrated into the landscape.

As the Old Jail and the Porto Court of Appeals, currently the Portuguese Center of Photography, located in Largo Amor de Perdição, is part of the National Interest Property Set, public entities have the possibility to prevent the construction. However, this decision incurs costs for the Directorate-General for Cultural Heritage due to the compensation that the owner is entitled to. In 2020, this public entity's budget amounted to 57.5 million euros, without considering this extraordinary expense. In this hypothetical scenario, consider that a crowdfunding campaign is launched to

finance the compensation payment to prevent altering the urban landscape. Crowdfunding corresponds to raising donations from various individual investors.

Q12. Considering your income and monthly expenses, would you agree to donate to the crowdfunding campaign to prevent the building from advancing and the urban landscape remaining as it is?

Yes

No

Maybe

Q13. Among the following options, which reason best justifies your previous response?
No disposable income
The State should assume this responsibility
I do not consider this an appropriate method
Other
I do not live in this region
This issue is not a priority
I need more information/time to respond

Q14. Considering your interest in the urban landscape in question, what is the donation value range in euros that you are willing to pay to prevent the construction in Largo Amor de Perdição?
Up to 25€
More than 100€
Between 25 and 50€
Between 50 and 100€

Q15-Q26. Would you be willing to pay the specified amount in donation to prevent the construction, as described previously?

Yes
No

Q27. Please assess the certainty level of your last response.
Definitely certain
Probably certain
Probably uncertain
Definitely uncertain

Q28. Considering your income and the variety of needs to be met within your budget, what is the donation amount in euros that you would be willing to pay to participate in the crowdfunding for the indemnity payment and prevent the construction of a building in Largo Amor de Perdição?

Q29. Gender:
Male
Female

Q30. Age:

Q31. Marital Status:
Single
Married
Cohabiting
Divorced
Widowed

Q32. How many individuals are there in your household, including yourself?

Q33. What is your household's gross annual income in euros?

Q34. What is your level of education?

Up to the 2nd cycle of basic education

Completed the 3rd cycle of basic education

Completed secondary education

Bachelor's degree

Master's or Postgraduate degree

Doctorate or Postdoctoral degree

Q35. Are there one or more individuals under the age of 15 in your household?

Yes

No

Q36. On a scale from one to ten, where one is right-wing and ten is left-wing, indicate your political preference.

Q37. On a scale from one to five, where one is extremely poor and five is exceptionally good, indicate your health status.

Q38. What is your permanent residence town?