

## **The monetary value of cultural goods**

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**The Monetary Value of Cultural Goods: A Contingent  
Valuation Study of the Municipal Supply of Cultural  
Goods in Lüneburg, Germany**

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by  
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# The Monetary Value of Cultural Goods: A Contingent Valuation Study of the Municipal Supply of Cultural Goods in Lüneburg, Germany

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Revised version

## Abstract

The paper describes an application of the contingent valuation method for assessing public approval of the amount of subsidies spent on cultural facilities. This is investigated using a contingent valuation study that captures the willingness to pay for the municipal cultural supply in Lüneburg, Germany. For the analysis of the results, an ordinary least squares and a tobit regression model are supplemented by a quantile regression (QR) model. The findings indicate that the QR can provide useful information in deriving implications for cultural policy that cannot be modeled by the conditional mean models.

Keywords: Cultural Goods, Contingent Valuation, Quantile Regression

JEL-Classification: H44, Z10

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# 1 Introduction

During the 2004/2005 season, nearly 44% of the 330 theatres and about 60% of the 6155 museums in Germany were run partially or completely by public authorities (Deutscher Buehnenverein, 2006/Institut für Museumsforschung, 2006)<sup>1</sup>. These figures reveal the major role of public authorities in the provision of cultural goods in Germany. Since German cultural policy is organized locally, the “Laender” (German Federal States) and the local authorities bear nearly 90% of the financial burden (Statistische Aemter des Bundes und der Laender, 2006). During the annual hearings on the municipal budgets, the amount spent on cultural goods is discussed and determined, depending principally on the financial burden of the previous year and necessary investments for the next year. However, the question of whether the amount of cultural goods provided by public authorities is economically optimal takes a back seat. This could be because of rent-seeking behavior of local politicians who do not want to diminish their available budget or because of missing information about the preferences of the population for cultural goods.

The latter point refers particularly to the so-called non-use values of a good which are not directly connected with its usage, like existence, option, bequest, education or prestige. These positive externalities generated by cultural goods cannot be internalized by the competitive market, e.g., via entrance fees. From the economic point of view, non-use values justify intervention into the market in the form of paying subsidies to increase supply according to the total demand of the people.

This study addresses the lack of information about the population’s preferences regarding cultural facilities provided by municipalities. It describes an application of the contingent valuation method (CVM) that can capture the use value generated by the publicly provided cultural facilities, as well as possible non-use values. The basic idea of the method is to present a hypothetical scenario of a quantity or quality change in a public good and asks individuals directly what they are willing to pay for the scenario to be realized.

The CVM has been applied to cultural goods for more than 20 years (Navrud/Ready, 2002). Comparable studies dealing with subsidies for the municipal cultural supply have found that, in most cases, the affected population approved of the

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<sup>1</sup> The total number of theatres and museums is derived from those which are recorded by the German Stage Association and the Institute for Museum Research.

amount of subsidies (for example Morrison and West, 1986 or Bille Hansen, 1997) or even supported higher amounts (Throsby and Withers, 1983).

In order to validate the results of the CVM and to explore the factors associated with preferences for the cultural facilities, the results of different regression models, namely an ordinary least squares (OLS) and a tobit regression, are analyzed. What is new is the supplementary use of a quantile regression model (QR) in the context of a cultural valuation study. QR provides the opportunity to compare the coefficients at different points of the distribution of the dependent variable. To my knowledge, it has been applied in the field of environmental economics for valuation studies on the introduction of less polluting public transport (O'Garra/Mourato, 2007) and the improvement of water resources (Belluzzo, 2004).

The QR gives a more detailed view of the factors that influence different WTP amounts than has heretofore been available and, therefore, allows for the heterogeneity of preferences. Beyond that, O'Garra and Mourato (2007) suggested that "there are numerous policy-related purposes for using QR on CV data." For example, concerning valuation studies in the field of cultural economics, information about which factors are associated with different levels of willingness to pay (WTP) could be used in order to develop appropriate price differentiation mechanisms with respect to entrance fees (cp. Frey, 2003). It would also be possible to offer special events and performances which could attract people with higher WTP. Overall, QR results can be used in order to adopt policy measures in a more efficient way.

The paper is organized as follows. Section 2 discusses the theoretical foundations of applying the CVM to cultural goods by presenting the WTP as a measure for utility. The methodology of the survey is described in section 3, followed by details of the empirical model in section 4. Sections 5 and 6 present the results of the empirical analysis, and section 7 concludes the paper.

## 2 The WTP as a measure for utility

The utility attributed to cultural goods arises from the direct use – e.g., the experience of a concert or a painting – and the indirect use – e.g., the prestige for a city or a region, generated by the uniqueness of a work of art. Stated preference methods like the CVM capture the WTP as a measure of utility by means of the analytical relationship between WTP and utility (e.g., Perman et al., 2003; Nicholson, 2005).

The utility can be described by the indirect utility function

$$U = V(p_y, I, q_x) \quad (1)$$

where  $p_y$  is a vector of prices for all private goods  $y$ ,  $I$  is the income, and  $q_x$  is an indicator for the quantity of the public good  $x$ . Expenditure functions in the form of

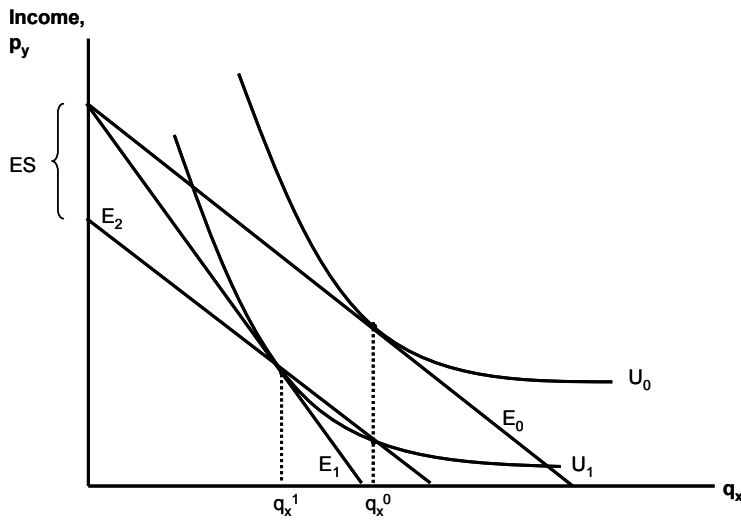
$$E = E(p_y, U, q_x) \quad (2)$$

are used to analyze the WTP by describing the minimal expenditures necessary to achieve a specific utility level  $U$ . As can be seen, the expenditure function is the inverse of the indirect utility function. The WTP for a quantity change of a specific public good can be measured by the difference between the minimal expenditures for the good before and after the quantity change ( $q_x^0$  and  $q_x^1$ ). In the case of an assumed reduction of the provided public good, e. g. the closure of a museum, the equivalent surplus (ES) measures the WTP for avoiding the change. The reference utility level is  $U^1$ , which reflects the utility after the change:

$$ES = E(p_y, U^1, q_x^1) - E(p_y, U^1, q_x^0) \quad (3)$$

Therefore, the ES is the amount which an individual is willing to pay to avoid the loss in utility resulting from a reduction in the publicly provided good.

**Figure 1: The equivalent surplus to avoid a quantity reduction of the public good**



This is illustrated in Figure 1<sup>2</sup>, where an individual is initially able to consume the quantity  $q_x^0$  of the public good  $x$ .  $E_0$  reflects the individual's budget constraint, which equals the minimal expenditure to achieve the utility level  $U_0$  when  $q_x$  is  $q_x^0$ . If, because of a policy measure, the quantity of the public good  $x$  decreases from  $q_x^0$  to  $q_x^1$  which equals a price increase of  $x$ , the budget constraint turns inwards, given by  $E_1$  and the individual's utility decreases to the level  $U_1$ . To analyze how much the individual would be willing to pay to avoid the policy measure and the corresponding utility decrease, a new expenditure level  $E_2$  must be drawn parallel to the initial level  $E_1$  which intersects the new utility level  $U_1$ , where  $q_x$  is  $q_x^0$ . The distance between the two expenditure levels  $E_0$  and  $E_2$  equals the amount of money the individual would have to spend to achieve the initial utility level  $U_0$  after the policy change, so it represents the ES.

When designing a CV study, it is important to consider whether the marginal or the total WTP is captured. The marginal WTP for a quantity change of a public good can be found by differentiating the expenditure function so it equals the Hicksian compensated inverse demand function (Pommerehne, 1987):

$$ES = \frac{\partial E}{\partial q_x} = E_{q_x}(p_y, U^1, q_x) \quad (4)$$

In this study the total WTP, which equals the sum of the marginal WTPs, is of interest. It can be shown by the path-dependent integral

$$ES = \int_{q_x^0}^{q_x^1} E(p_y, U^1, q_x) dq_x \quad (5)$$

The functional connections show that the WTP captured in contingent valuation studies can serve as a measure for utility.

### 3 Survey and methodology

The aim of the survey was to determine respondents' WTP for the municipal supply of cultural goods in Lueneburg. The supply includes a theatre, three museums, a music

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<sup>2</sup> Figure 1 and its description follow Perman et al. (2003).

school, two libraries, an education center for experimental music, a town museum, a center for the promotion of literature, a series of classical concerts and temporary art exhibitions, a center for cultural performances, and measures for the preservation of ancient monuments and buildings. Since the town is comparatively small (about 71.000 inhabitants), it can be assumed that most of the cultural facilities presented in the questionnaire are well known to the respondents. The population of this survey were all inhabitants of the city of Lueneburg who were 18 years old or older. Questionnaires containing a CVM scenario were sent to a random sample of 5,000 people provided by the registration office. Out of the 4,696 letters which could be delivered<sup>3</sup>, about 30% (1,447) were filled out and returned.

The scenario includes the implementation of a monthly contribution paid to the town. The amount of this hypothetical contribution will be calculated as the average of all stated WTP amounts so that it is independent of the respondents' income level. It displaces the part of taxes which had been expended for cultural goods. Thus, if the average WTP of all respondents were equal to or lower than the actual tax burden for these goods, the contribution would not imply an additional financial burden.

The chosen elicitation method is a set of presented € amounts. The respondents were asked to mark the amount they would be willing to pay for the supply of cultural goods in Lueneburg. (See appendix 1.) The NOAA panel argued that this elicitation method "is likely to create anchoring and other forms of bias" (Arrow et al., 1993) so, to reduce those effects, the € amounts were widely ranged in order to avoid giving a clue about what could be the expected or socially acceptable value. Moreover, the set of € amounts was followed by an open-ended question to grant the respondents an option to specify their previously stated amount, although only 3% answered the follow-up question.

To avoid establishing false incentives, the survey informed respondents that the supply of cultural goods would be restricted if the average WTP were lower than the actual amount spent on cultural goods. Thus, the amount the respondents would have to pay is contingent on the stated WTP, which offers incentives to behave strategically. Nevertheless, the impact of a single stated WTP amount on the amount of the contribution is comparatively small, so that the incentives should be "weak to moderate" (Mitchell/Carson 1990). However, it implies that respondents need

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<sup>3</sup> Most of the remaining letters could not be delivered because people did not notify their change of address at the registration office.



information about how much is paid at the moment (4.70 € per month and capita of the population), which can cause a strong anchoring bias.

**Figure 2: Distribution of the stated WTP € amounts in %**

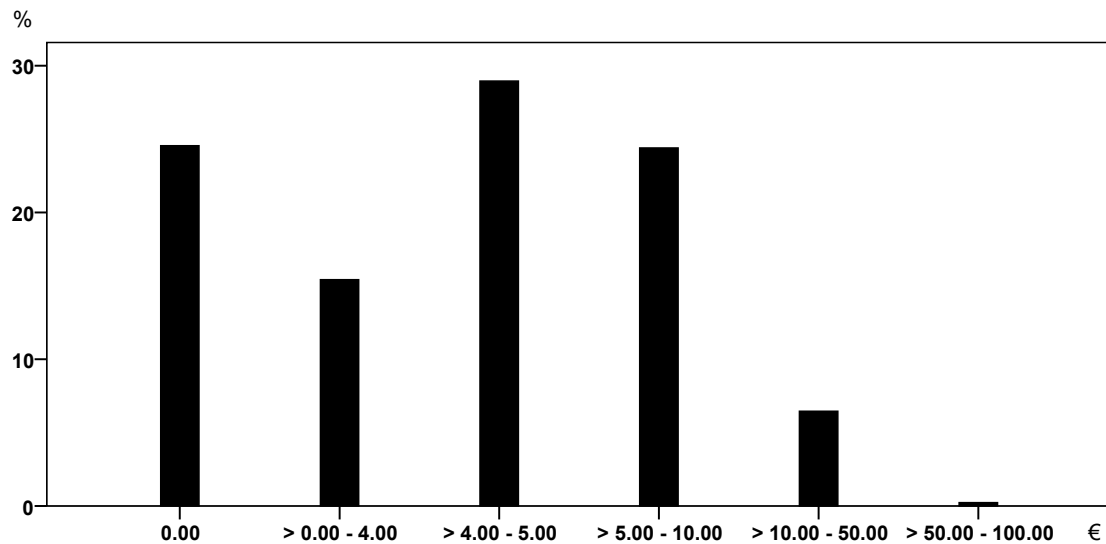


Figure 2 shows the distribution of the stated WTP amounts. It is apparent that there is a strong anchoring bias since more than 27% of all respondents stated a WTP value that range between 4.00 and 5.00 €, which is very close to 4.70 €. Nevertheless, it is important to provide the status quo in order to enable respondents to consider whether they prefer to spend more or less for this good. Moreover, information such as this is given in comparable non-hypothetic situations, such as public referenda (e.g., Frey/Pommerehne, 1990 or Schulze/Ursprung, 2000).<sup>4</sup>

#### 4 The empirical model

Since the idea is to explore the factors associated with the respondents' preferences for the cultural municipal supply in Lueneburg, the dependent variable in the empirical model is the stated WTP. The first group of independent variables in the model refers to the use value and the non-use values. A dummy variable, "indicator use value", which divides the respondents into users and non-users, captures the use value generated by cultural goods. The non-user group is defined as respondents who have not visited one of the museums, the theatre, one of the libraries, an art exhibition or a concert within a

<sup>4</sup> For a more detailed discussion, see, for example, Hansen (1997).

year from the date of the survey. Non-users also do not participate actively in the town's cultural life, e.g., in a development association of a museum or in a choir.

Since Hamburg is easily accessible from Lueneburg and offers a wide range of high-quality cultural facilities, its cultural supply presents an alternative to the supply of Lueneburg. This substitutive relationship can decrease the use value related to cultural goods in Lueneburg, so a dummy for using cultural facilities in Hamburg is included.

In order to capture the all-over acceptance of the non-use concept, the respondents were given four statements concerning possible non-use values attributed to the supply of cultural goods. They were asked to state their level of agreement with these statements on a given scale; then the four values were averaged for each respondent. This variable is included in the model as an indicator of the non-use values attributed to the municipal supply of cultural goods.

The second group of independent variables contains dummies for the general interest for culture (medium interest, high/very high interest). The last group of independent variables in this model consists of socio-economic and socio-demographic variables, namely, the respondents' sex, age group, employment status, highest educational achievement, income level and household size. Non-response to required questions relevant to the model's variables reduced the number of qualified surveys to 1,062.

## 5 Descriptive results

The fraction of zero-bids of all respondents who stated a WTP amount is presented in Table 1. One-fourth of the 1,316 WTP amounts stated in the survey were zero-bids. If the respondents stated a WTP equal to zero, they were asked for the reason in a follow-up question. 14% of them answered that they were generally not interested in cultural goods, while nearly 70% reported that they are already paying enough taxes and other contributions. Regarding the latter group of respondents, it is not certain that they have a WTP equal to zero; their WTP may be positive but, because of the payment vehicle offered in the scenario, they stated a zero-bid. Thus, the fraction of zero-bids could decrease if, for example, voluntary donations instead of a contribution were proposed<sup>5</sup> and the more accurate fraction of zero-bids could be smaller than one-fourth.

**Table 1: Zero-bids**

Fraction of zero-bids	N° of observations (percent of all stated WTP amounts)
WTP > 0	993 (0.75)
WTP = 0	323 (0.25)
Reasons for a WTP = 0	N° of observations (percent of all zero-bids)
Generally no interest	46 (0.14)
Already paying enough taxes and contributions	225 (0.70)

**Table 2: Descriptive Statistics, complete sample**

Variables	No. of observ.	Mean	Std. Dev.	Minimum	Maximum
WTP in €	1316	5.63	7.2858	0	100
User (1 = yes)	1447	0.8397	0.3670	0	1
Female (1 = yes)	1439	0.5650	0.4959	0	1
26 – 35 years old (1 = yes)	1441	0.1867	0.3898	0	1
36 – 55 years old (1 = yes)	1441	0.3602	0.4802	0	1
56 years and older (1 = yes)	1441	0.3400	0.4739	0	1
Self-employed (1 = yes)	1413	0.0849	0.2789	0	1
Civil servant (1 = yes)	1413	0.0913	0.2881	0	1
Employee (1 = yes)	1447	0.3386	0.4734	0	1
Trainee/Student (1 = yes)	1447	0.1285	0.3348	0	1
Housewife/Househusband (1 = yes)	1413	0.0665	0.2493	0	1
Pensioner (1 = yes)	1413	0.2435	0.4293	0	1
Unemployed (1 = yes)	1447	0.0346	0.1827	0	1
Lower education (1 = yes)	1386	0.3939	0.4888	0	1
Higher sec. schooling (1 = yes)	1386	0.2330	0.4229	0	1
University degree (1 = yes)	1386	0.3716	0.4834	0	1
Income < 1999 € (1 = yes)	1244	0.5338	0.4991	0	1
Income 2000 – 2999 € (1 = yes)	1244	0.2211	0.4151	0	1
Income 3000 – 3999 € (1 = yes)	1244	0.1463	0.3536	0	1
Income > 4000 € (1 = yes)	1244	0.0989	0.2986	0	1

Table 2 presents some basic descriptive results for the variables used in the model. The mean of the WTP regarding the complete sample is 5.63 €, which is significantly higher than the 4.70 € amount given for subsidies, but which is the product of a wide spread of response, from 0 € to 100 €. Only one respondent stated a WTP greater than 100 €. As

the amount was not specified in the follow-up question, the answer is not considered in further analysis.

Nearly 84% of all respondents were users of cultural goods, which means that they either attended one of the listed cultural goods at least one time during the previous year or they participated actively in the town's cultural life in the previous year.<sup>6</sup> The remaining 16% could consume private cultural goods, like CDs, books, private theatre attendance or other public cultural goods, such as the municipal supply of other cities, e.g. Hamburg. Nevertheless, they did not report using the goods which should be valued in this study so, in the context of this study, they are defined as non-users.

**Table 3: Descriptive Statistics, compared for users and non-users**

Variables	Mean users	Mean non-users	P-value
WTP in €	6.08	3.14	0.0000
Female (1 = yes)	0.5742	0.5209	0.1514
26 – 35 years old (1 = yes)	0.1957	0.1495	0.0878
36 – 55 years old (1 = yes)	0.3724	0.3084	0.0650
56 years and older (1 = yes)	0.3287	0.3692	0.2577
Self-employed (1 = yes)	0.0879	0.0725	0.4359
Civil servant (1 = yes)	0.0980	0.0580	0.0305
Employee (1 = yes)	0.3528	0.2837	0.0413
Trainee/Student (1 = yes)	0.1253	0.1535	0.2869
Housewife/Househusband (1 = yes)	0.0595	0.1063	0.0388
Pensioner (1 = yes)	0.2353	0.2609	0.4394
Unemployed (1 = yes)	0.0330	0.0465	0.3766
Low education (1 = yes)	0.3701	0.5327	0.0000
Higher sec. schooling (1 = yes)	0.2326	0.2312	0.9645
University degree (1 = yes)	0.3964	0.2312	0.0000
Income < 1999 € (1 = yes)	0.5146	0.6529	0.0006
Income 2000 – 2999 € (1 = yes)	0.2263	0.1941	0.3309
Income 3000 – 3999 € (1 = yes)	0.1549	0.0882	0.0069
Income > 4000 € (1 = yes)	0.1042	0.0647	0.0624

To explain the WTP in more detail, the differences between the means of the users and the non-users of the municipal supply of cultural goods in Lueneburg are presented in Table 3. As the latter group stated they did not use one of the listed cultural facilities, they should not attribute a direct-use value to the municipal supply; even so, 55% of the non-users stated a positive WTP, which can be explained by non-use values. The mean

WTP of the non-users was 3.14 €, which is significantly lower than the mean WTP of the users. However, if the users had non-use values of the same size, the non-use values would constitute over 50% of the users' total mean WTP.

The user group was made up of significantly more civil servants and employees than the non-user group, a finding which may be related to the relatively stable income situation of these two occupational categories. By contrast, the proportion of housewives and househusbands was significantly smaller in the user group. The two groups also differ in educational and income levels; 53% of the non-users reported no or low educational achievement, which is significantly less education than that reported by the user group, and a significantly lower proportion of non-users reported having a university degree. These findings suggest a lower level of cultural education, leading to a lower level of cultural use. Similar results on income levels may also explain lower levels of cultural use. The non-users have a significantly higher proportion of respondents with an income level less than 2000 € and a lower proportion in the two highest income groups compared to the users. These results confirm the current hypotheses in cultural economics that a lower income level, as well as a lower education level, is negatively correlated with the use of (and, therefore, the WTP for) cultural goods (see, for instance, Frey/Pommerehne, 1990, Withers, 1980 or Dickinson, 1997).

## 6 Multivariate results

This section presents the results of the multivariate analysis. The empirical model presented in section 4 is first estimated by OLS, followed by a tobit regression. In a last step, a QR is applied and the results are compared with those of the other methods. The intention of the multivariate analysis is to identify factors associated with the respondents' WTP. All regression estimates are based on 1,062 observations.

To create an initial benchmark for the assessment of the QR results, an OLS regression model<sup>7</sup> is estimated. The results show that only a few variables have a significant influence on the WTP. In accordance with the theory of cultural economics, the results show that higher indicators for individual use value, as well as for non-use values, *ceteris paribus* lead to a higher WTP for the municipal supply in Lueneburg. Therefore, it is possible to detect non-use values, even though they cannot be captured by the competitive market. In the survey, non-use values are captured on an

ordinal scale, which makes it difficult to reveal their correct scope. Still, compared to those respondents who have no educational achievement or have not completed higher secondary schooling (Abitur), the respondents with a university degree have a significantly higher WTP.

**Table 4: Results for different regression models of the WTP for cultural goods in Lueneburg**

	Model 1 OLS regression	Model 2 Tobit regression	Model 3 Median regression
Indicator use value	1.080 (0.041)	1.598 (0.048)	1.125 (0.017)
Attendance at cultural activities in Hamburg	0.311 (0.151)	0.462 (0.142)	0.040 (0.890)
Indicator non-use values	0.761 (0.000)	1.328 (0.000)	0.685 (0.000)
Medium interest	0.600 (0.312)	1.323 (0.066)	1.107 (0.026)
High/very high interest	1.124 (0.098)	1.828 (0.025)	1.416 (0.008)
Female	0.374 (0.404)	0.580 (0.273)	-0.084 (0.771)
26 – 35 years old	1.905 (0.146)	2.018 (0.051)	0.060 (0.914)
36 – 55 years old	1.489 (0.225)	1.459 (0.193)	-0.597 (0.343)
56 years and older	1.433 (0.248)	1.191 (0.352)	-0.717 (0.316)
Self-employed	1.534 (0.066)	1.602 (0.093)	1.324 (0.062)
Civil servant	-0.132 (0.823)	-0.289 (0.742)	0.002 (0.997)
Trainee/student	1.823 (0.087)	2.141 (0.040)	-0.332 (0.543)
Housewife/househusband	-0.190 (0.830)	-0.012 (0.992)	0.506 (0.414)
Pensioner	0.382 (0.545)	0.286 (0.758)	-0.051 (0.913)
Unemployed	-0.691 (0.342)	-1.425 (0.305)	-1.094 (0.071)
Higher secondary schooling	0.760 (0.122)	1.129 (0.136)	0.399 (0.353)
University degree	1.191 (0.010)	1.829 (0.004)	0.668 (0.032)
Income 2000 – 2999 €	1.201 (0.026)	1.624 (0.018)	0.913 (0.026)
Income 3000 – 3999 €	1.108 (0.059)	1.676 (0.030)	0.994 (0.026)
Income > 4000 €	1.883 (0.012)	2.002 (0.032)	1.694 (0.017)
N° adults living in household	0.181 (0.595)	0.181 (0.513)	0.220 (0.160)
N° children living in household	0.274 (0.363)	0.299 (0.221)	0.050 (0.735)
Constant	-4.139 (0.020)	-10.205 (0.000)	-1.996 (0.048)
N° of observations	1062	1062	1062
R <sup>2</sup>	0.0907		
Pseudo R <sup>2</sup>		0.0222	0.0560

P-values are reported in parentheses behind the coefficient estimate.

The results also show significant impact on the stated WTP amounts by the three income levels above 2000 €, compared to those with lower income levels.

Since the payment vehicle in this study is a set of presented WTP amounts censored down to zero, additionally a tobit regression can be applied (see, e.g., Santagata/Signorello, 2000). Although the magnitude of coefficients cannot be interpreted in the same way as the OLS estimates, the pattern of signs and the level of significance of the coefficients can be compared between both models (McDonald/Moffitt, 1980). For this reason, a tobit regression is applied to validate these two dimensions of the OLS estimates.

All signs of coefficients of the OLS model are validated by the tobit model, and all significant coefficients estimated by the OLS regression are confirmed. Moreover, the tobit regression shows a significant impact on the WTP for those respondents who stated they have high or very high interest in culture in general, compared with those who stated they have low or no interest in culture. Although these results may appear trivial, they validate the respondents' self-assessment regarding their preferences for culture and cultural goods. Finally, the tobit model indicates a significantly higher WTP for trainees and students compared to employees, all other factors remaining the same, which may be explained by the fact that trainees and students normally have more leisure time than do other workers. However, while the coefficients' levels of significance differ for the three variables, the absolute differences between the corresponding p-values are not large. To sum up, the results of the tobit regression validate the OLS estimates, which now can be used as a benchmark for further analysis.

The third model used in the multivariate analysis is a QR model, which produces a "more focused view of the application than could be achieved by looking exclusively at conditional mean models" like OLS or tobit (Koenker, 2005). Hence, in this study the model can provide more detailed information about the respondents' WTP and can thereby account for the heterogeneity of preferences. While the OLS and the tobit regression models include the squared residuals, the coefficients for the QR are obtained by minimizing the sum of residuals, which makes the model less sensitive to outliers (cp. Fahrmeir et al., 2007). Therefore, the QR is particularly suitable for this analysis, as nearly 94% of all results in the study's data set lie between 0 € and 10 €, although the total range is 100 € (Figure 2). The QR provides the opportunity to compare the coefficients at different points of the distribution. In addition to the quartiles (0.25, 0.50,

0.75), the 0.90 quantile is analyzed because the coefficients' impact on higher WTP amounts is of particular interest. Table 5 shows the different quantiles and the corresponding WTP amounts.

**Table 5: Distribution of the WTP over the quantiles**

Quantile	0.25	0.50	0.75	0.90
WTP in €	1.00	5.00	7.50	10.00

When the results of the median regression (at the 0.50 point of the distribution) are contrasted with the OLS estimations listed in Table 4, all significant coefficients have the same sign, and nearly all are similar in magnitude. The only exception is the dummy for having a university degree, which has a lower impact at the median of the QR model. As Table 5 shows, this comes about because having a university degree has an impact on WTP not exceeding 2 €, which is significant on the 1% level; hence, the OLS estimate for this variable is influenced strongly by respondents who stated lower WTP amounts. Given that more than 24% of the respondents stated a WTP of zero, the 0.25 quantile can be interpreted as the critical point in the decision for or against a positive WTP. Therefore, having completed higher secondary schooling seems to have an impact on the decision for a positive WTP, but no relevant impact on the amount of the WTP.

In comparing the results over the different quantiles, only the coefficient for the variable “high or very high interest for culture in general,” compared to those who have no or a low interest, is statistically significant over all analyzed quantiles. Although the coefficients are rising over the quantiles for all but the 0.50 quantile, the relative impact on the WTP amount decreases. The coefficient for the medium-interest variable is significant only for the 0.25 and 0.50 quantile, which is consistent with the previous results since it can explore only factors associated with lower WTP amounts.

The indicator for the use value has an impact on the WTP up to the 0.50 quantile. Compared to this, the estimated coefficients for the indicator of non-use values are significant at an error level of 0% for the 0.25, 0.50 and 0.75 quantiles, which points out that the non-use values can be associated with the respondents' WTP up to 7.50 €. However, the significant coefficients of the non-use value indicator are comparatively small and clearly lower than the use value estimates. Beyond that, the estimated



coefficients for both indicators are constant in absolute magnitude over the quantiles, which suggests a decreasing relative impact on the WTP.

**Table 6: Results for the QR of the WTP for cultural goods in Lueneburg**

	Quantile Regression			
	0.25	0.50	0.75	0.90
Indicator use value	1.1109 (0.007)	1.125 (0.017)	1.0415 (0.135)	-0.1875 (0.893)
Attendance at cultural activities in Hamburg	0.0653 (0.654)	0.040 (0.890)	0.6306 (0.134)	0.375 (0.619)
Indicator non-use values	0.7262 (0.000)	0.685 (0.000)	0.8168 (0.000)	0.175 (0.657)
Medium interest	0.8678 (0.027)	1.107 (0.026)	1.0525 (0.065)	0.4875 (0.596)
High/very high interest	1.4755 (0.002)	1.416 (0.008)	1.9315 (0.010)	2.225 (0.044)
Female	0.1360 (0.681)	-0.084 (0.771)	-0.3778 (0.346)	-0.1938 (0.805)
26 – 35 years old	0.4778 (0.407)	0.060 (0.914)	1.2543 (0.098)	2.6375 (0.054)
36 – 55 years old	0.4846 (0.435)	-0.597 (0.343)	0.5743 (0.485)	2.4563 (0.062)
56 years and older	0.4005 (0.545)	-0.717 (0.316)	0.4808 (0.634)	2.5438 (0.179)
Self-employed	0.4206 (0.509)	1.324 (0.062)	0.6433 (0.330)	1.35 (0.645)
Civil servant	-0.1996 (0.641)	0.002 (0.997)	-0.1751 (0.792)	-0.0438 (0.972)
Trainee/student	0.2816 (0.605)	-0.332 (0.543)	0.4501 (0.610)	2.9125 (0.099)
Housewife/househusband	-0.6622 (0.343)	0.506 (0.414)	-0.0384 (0.962)	-0.0875 (0.957)
Pensioner	-0.8979 (0.055)	-0.051 (0.913)	0.1130 (0.889)	0.1813 (0.911)
Unemployed	-0.7032 (0.213)	-1.094 (0.071)	-0.5200 (0.676)	-0.5875 (0.810)
Higher secondary schooling	0.8004 (0.066)	0.399 (0.353)	0.7422 (0.207)	0.0188 (0.984)
University degree	1.2008 (0.001)	0.668 (0.032)	0.7878 (0.114)	0.2563 (0.783)
Income 2000 – 2999 €	0.8768 (0.054)	0.913 (0.026)	1.4939 (0.003)	1.8313 (0.077)
Income 3000 – 3999 €	1.2336 (0.003)	0.994 (0.026)	1.9722 (0.001)	1.8438 (0.064)
Income > 4000 €	1.0317 (0.049)	1.694 (0.017)	2.0774 (0.002)	4.7875 (0.082)
N° adults living in household	0.1730 (0.311)	0.220 (0.160)	0.0470 (0.830)	-0.1063 (0.858)
N° children living in household	-0.0176 (0.904)	0.050 (0.735)	0.0494 (0.807)	0.4063 (0.634)
Constant	-5.1556 (0.000)	-1.996 (0.048)	-1.4577 (0.362)	4.2063 (0.172)
N° of observations	1062	1062	1062	1062
Pseudo R <sup>2</sup>	0.1277	0.0560	0.0857	0.0200

P-values are reported in parentheses behind the coefficient estimate.

Among those in the income class of 2000-2999 €, there is an impact on the stated WTP for the 0.50 and the 0.75 quantiles, compared to the base category of income under 2000 €. For the income classes of 3000-3999 € and 4000 € and more, there are significant coefficients for all but the 0.90 quantile, compared with the base

category. For every quantile, the magnitude of the significant coefficients increases with higher incomes, which shows the meaningful impact of income level on WTP for cultural goods.

Overall, the findings suggest that, the higher the WTP, the less well the QR model is able to explore influencing factors. This is reflected in the decreasing number of significant coefficients and in the coefficients' decreasing relative impact on the WTP amounts. Therefore, as most of the variables included in the model refer to socio-economic and socio-demographic characteristics, they have a bearing on zero-bids and on low WTP amounts, but almost none on higher WTP amounts.

Regarding distribution, the null hypothesis – that the coefficients are equal between pairs of quantiles and across all quantiles – cannot be rejected for almost all findings. (See appendix 2.) The absence of heterogeneity points to the empirical validity of the OLS estimators.

## 7 Conclusion

This paper studied the WTP for cultural goods using the example of the municipal supply of cultural goods in Luenenburg, Germany. For this purpose, a dataset of 1,447 questionnaires was analyzed using descriptive statistics, as well as OLS, tobit and QR models.

First, the results of the survey, particularly the means, suggest that the population of Luenenburg agrees with the amount spent on the municipal supply of cultural goods by the public authorities. Moreover, non-use values are detected because the mean WTP of the non-users is positive and because the acceptance levels of statements concerning possible non-use values attributed to the supply of the town's cultural facilities was high. These results indicate the existence of positive external or non-use effects, which can legitimate economically the subsidies paid by the public authorities. However, the results must be considered carefully because of the strong anchoring bias that results from revealing the actual tax amount spent on the town's cultural facilities.

The multivariate analysis focuses on the QR model, which is applied in order to take the heterogeneity of responses into account. As a benchmark, an OLS model, which is conditional on the mean, is first estimated, and then compared with the results of the QR model. For example, for the dummy for having a university degree, the OLS

shows the expected significant impact on the stated WTP. By comparison, the QR model reveals that the variable has a decreasing impact on WTP up to 5.00 €, but no impact for higher stated WTP amounts; at the same time, there is a significant impact of higher income on higher WTP amounts up to 7.50 €. In this study, the results point out that higher WTP amounts for the supply of cultural goods are less a question of education than of income, suggesting that it would make sense to concentrate on internalizing the demand of people with lower incomes, e.g., via reduced entrance fees.

Moreover, as only the variable “high/very high interest” for culture in general shows a significantly positive influence over all analyzed quantiles of the WTP distribution, one who wanted to encourage additional spending on culture could aim to promote cultural education in schools to arouse the interest in and increase the WTP for culture. The only variable which had *ceteris paribus* a significant impact only at the 0.90 quantile, which corresponds to a WTP of 10 €, is the dummy for age 26-35. Hence, policymakers could consider offering more events and performances targeted to this age group in order to reap additional benefits.

Overall, the results of the multivariate analysis show that the QR provides more detailed information useful with regard to implications for cultural policy, compared to traditionally applied methods for valuation data like OLS or tobit. Especially in the absence of a market, as is the case, to a large extent, in the German example, that information can be useful in accounting for the people’s preferences.

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## Appendix 1: The valuation question presented in the questionnaire

Imagine that the municipality of Lueneburg plans to implement a mandatory contribution to finance the cost of cultural facilities. Every citizen 18 years or older has to pay the contribution, which is the same for everyone. In order to determine the amount of the contribution, the public authorities need to know the citizens' preferences regarding how much should be spent on cultural facilities, and the contribution will be calculated as the average of all amounts stated on the survey. If the average is lower than or equal to the amount currently spent in the form of taxes (4.70 €), the supply of cultural events/facilities must be restricted.

Please mark the € amount which you are willing to pay monthly for the municipal supply of cultural goods in Lueneburg in the form of the described contribution:

- |        |                          |         |                          |            |                          |
|--------|--------------------------|---------|--------------------------|------------|--------------------------|
| 0.00 € | <input type="checkbox"/> | 7.50 €  | <input type="checkbox"/> | 40.00 €    | <input type="checkbox"/> |
| 1.00 € | <input type="checkbox"/> | 10.00 € | <input type="checkbox"/> | 50.00 €    | <input type="checkbox"/> |
| 2.00 € | <input type="checkbox"/> | 12.50 € | <input type="checkbox"/> | 75.00 €    | <input type="checkbox"/> |
| 3.00 € | <input type="checkbox"/> | 15.00 € | <input type="checkbox"/> | 100.00 €   | <input type="checkbox"/> |
| 4.00 € | <input type="checkbox"/> | 20.00 € | <input type="checkbox"/> | > 100.00 € | <input type="checkbox"/> |
| 5.00 € | <input type="checkbox"/> | 30.00 € | <input type="checkbox"/> | n/a        | <input type="checkbox"/> |

If the amount you are willing to pay monthly is not listed above, please specify your answer here:

\_\_\_\_\_ €

## Appendix 2: Tests of parameter equality across quantiles

	High/very high interest	Medium interest	Indicator use value	Indicator non-use value	Att. cultural activities in HH	Female	26 – 35 years old	36 – 55 years old	56 years and older	Self- employed	Civil servant
0.25 vs. 0.50	0.9026	0.5599	0.9749	0.7390	0.9150	0.4655	0.4232	0.0682	0.0910	0.1832	0.6635
0.25 vs. 0.75	0.5509	0.7542	0.9227	0.6411	0.1613	0.2530	0.3143	0.9156	0.9376	0.7700	0.9716
0.25 vs. 0.90	0.5067	0.6856	0.3486	0.1518	0.6714	0.6882	0.1162	0.1312	0.2469	0.7470	0.9017
0.50 vs. 0.75	0.4278	0.9190	0.8917	0.4243	0.1027	0.3926	0.0708	0.1129	0.1688	0.2957	0.7672
0.50 vs. 0.90	0.4460	0.5048	0.3130	0.1562	0.6329	0.8843	0.0491	0.0164	0.0675	0.9926	0.9700
0.75 vs. 0.90	0.7572	0.4834	0.2978	0.0412	0.6712	0.7932	0.2389	0.0907	0.1711	0.7950	0.9041
Joint test	0.8437	0.8540	0.7692	0.1784	0.4123	0.7151	0.1571	0.0489	0.1197	0.5208	0.9695

	Trainee/ Student	Housewife/ -husband	Pensioner	Unemployed	Higher sec. schooling	University degree	Income 2000 – 2999 €	Income 3000 – 3 999 €	Income > 4000 €	N° adults living in hh	N° children living in hh
0.25 vs. 0.50	0.2500	0.0776	0.0694	0.5043	0.3625	0.1144	0.9342	0.5934	0.2899	0.7810	0.6657
0.25 vs. 0.75	0.8491	0.4952	0.2279	0.8777	0.9273	0.4390	0.2850	0.2573	0.1294	0.5919	0.7519
0.25 vs. 0.90	0.1386	0.7322	0.5070	0.9618	0.4284	0.3154	0.3683	0.5539	0.1647	0.6381	0.6179
0.50 vs. 0.75	0.3217	0.4501	0.8146	0.5938	0.5189	0.7837	0.1904	0.0661	0.5379	0.3426	0.9981
0.50 vs. 0.90	0.0597	0.7106	0.8798	0.8287	0.6883	0.6445	0.3716	0.3965	0.2365	0.5699	0.6734
0.75 vs. 0.90	0.1113	0.9736	0.9604	0.9738	0.3837	0.5217	0.7139	0.8900	0.2831	0.7782	0.6602
Joint test	0.1989	0.3330	0.3390	0.8764	0.5971	0.3996	0.5873	0.3226	0.3730	0.7973	0.9416



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