

## Public Library Service Value Assession in Xi'an by CVM

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**Abstract** - This study focuses on the relationship library service and residents' willingness to pay for public library service in the city of Xi'an. As a means of quantifying an individual's willingness to pay (WTP) for public library service, a contingent valuation method (CVM) was employed. A sample of 525 residents was chosen, based on the stratified sampling method. The respondents' WTP was then elicited through a series of face-to-face interviews, conducted using a range of hypothetical, open-ended scenario questions. The results showed that 74.7% of respondents were able to express a positive WTP, and that the average WTP was 200 RMB per person, per year in Xi'an..

**Keywords** - Willingness to pay ; Contingent valuation method ; Public library service ; Value assessment; Xi'an.

### I. INTRODUCTION

To capture all benefits accruing from public libraries, we distinguish among "use values," "nonuse values," and "total value" of public libraries. These are terms developed in economics in relation to valuing nonmarket goods and have the quality of being measurable. "Use value of libraries" is defined as the sum of two value components: the values of those who currently make active use of libraries (direct use value) and the values of those who intend to, or may, make such use in the future (option value). Conceptually, the definition of direct use value concurs with the definition of direct benefits by Fraser et al. (2002) [1]. Addition to use value, economists have (for the last 30 years) recognized that individuals may also derive satisfaction from a good's mere presence, independent of their (actual and future prospective) use of it (Arrow et al., 1993) [2]. Such "nonuse values of a public library" may be due to libraries being part of the cultural heritage, are important for the national literature, benefit others in society, contribute to the general breeding, and development of creativity, social criticism, esthetic, and ethical abilities. The three main nonuse value motivation groups, identified in the economics literature (Kolstad, 2000) [3], are existence or preservation value, bequest value, and altruistically motivated value. The "total value of libraries" is the sum of their use and nonuse values [4].

Two main groups of methods for valuing public goods can be distinguished: those based on revealed preferences (RP) and those on stated preferences (SP). Only SP methods

are able to capture both use and nonuse values. Among these, the contingent valuation method (CVM) is by far the most frequently applied. But CVM has rarely been used in public library service valuation in China. and a general lack of previous China-based valuation studies based on the CVM technique, Practicing this valuation method has clear advantages.

### II. METHOD

#### A. CVM

CVM has been in use as a means of valuating a wide range of nonmarket goods and services for over 35 years, with over 2000 papers and studies using this method, most of which were from developed countries (Carson , 2000)[5]. It is difficult to measure the benefit of public library service by traditional means such as the dose-response method. The contingent valuation method (CVM), however, is a useful tool when dealing with this type of issue, as it can obtain a monetary value for an intangible good that does not have a market price. In order to do this, CVM presents consumers with hypothetical opportunities to buy public goods and elicits preferences by asking people about their willingness to pay (WTP) for them , thus circumventing the absence of a real market. (Mitchell and Carson, 1989) [6] This approach enables individuals to take account of all factors (e.g. income level, socio-economic characteristics, consumption of non-market goods, etc.) that are important to them in the provision of the service. Within this study , the non-market good is the idea of public library service quality improvement.

CVM has been produced in several formats: open-ended, bidding game, dichotomous choice (DC) and payment card format. Among these methods, the open-ended format CV has its own advantages, including a much more efficient use of data, and absence of a starting-point and yea-saying bias (Carlsson, 2000) [7]. According to previous studies carried out by Langford, the open-ended format can be useful in providing information that can be obtained from smaller scale studies, which have been often undertaken as a precursor to a DC survey (Langford et al., 1998) [8]. Thus, although uncertainties exist about several of the components of open-ended (OE) methodology, the

results provide reasonable estimates of the range of residents' willingness to pay for public library server.

### B. Willingness-To-Pay Model

Assuming that the consumer's personal utility  $u$  is the function of the state public library services  $q$ , and his personal income  $Y$  and his socio-economic characteristics  $x$ , namely:  $u = u(q, y, x)$ .

If the state of public library services transited from the state  $q_0$  to  $q_1$  ( $q_1 > q_0$ ), correspondingly, the consumers should make corresponding changes in income in order to maintain the same level of benefits.

Assuming  $W$  to be true WTP, its random effect is not observed,  $W$  distribution depends on the function  $G_w$ . We is the mean of WTP, its value can be expressed as by the following integral:

$$W_e = \int_0^T [1 - G_w] dA \tag{1}$$

Where,  $T$  is some upper bound of infinity, when it is taken WTP is true; WTP is value of the mean at any stage. The median WTP can be gained by:

$$P[u(q, Y - W, X) \geq u(Q_0, Y, X)] = 0.5 \tag{2}$$

In other words, the mean WTP is the WTP when the half willingness to pay public library services and half reluctant [9-10].

### C. CVM used in libraries service valuation experience

Studies of libraries service using CV have taken place in the USA, Norway and the UK in recent years (Aabo and Audunson, 2002; Barron et al., 2005; Bolton Metropolitan Borough Council and MLA North West, 2006; Griffiths et al., 2004; St Louis Public Libraries, 1999) [11-15].

Taking into account the multiple advantages of the open-ended question format and a lack of information from other formats, we finally chose to use OE CVM in our questionnaire. We hope that our research can determine residents' degree of satisfaction with Xi'an public library service quality and provide useful information as guidance for establishment and implementation of public library management policy.

## III. DESIGNING PUBLIC LIBRARY VALUE ASSESSMENT BASED ON CVM

Mainly it includes 5 stages based on the CVM public library value assessment system: Determination investigation object and scope, questionnaire design stage, survey phase, result analysis stage, validity check stage. As shown in Figure 1.

### A. design of investigate questionnaire

Questionnaire design is the most important part of 5 stages, CVM questionnaire design is very tricky, and let the reader is willing to answer, easy answer, no concept of ambiguity. First of all, to include the basic information of a reader for hierarchical classification statistics, this can analyse

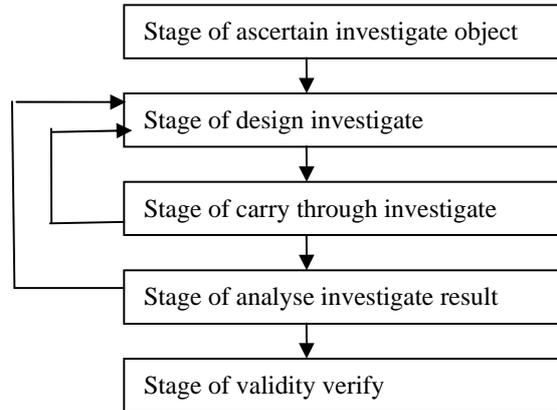


Figure1. CVM-based public library services value assessment process

the causes of some of the differences. This kind of investigations usually are anonymous, but should contain this foundation information, like gender, age, education level, specialty, profession, average income, average spending and so on; The second part of investigation is accepting the payment wish to public library service, namely, Public library and its services to continue to exist, the respondents were willing to pay the maximum annual amount of money. [16] In the hypothetical market scenarios subject design, we should ensure communication integrity, the concept of accurate, can not be ambiguous, but also respect for the reader's psychological preferences.

TABLE.I. VALUE OF PUBLIC LIBRARY SERVICES SURVEY (PRICE UNIT: RMB / YEAR)

Gender _____	Age _____	Education level _____	
Specialty _____			
Profession _____	Average Income _____	Average Spending _____	
Services	charge or not	Frequency of use last week	WTP
OPAC			
Library Card			
Studyroom Permits			
Counselling Service			
E-Journals Account			
E-Book Account			

### B. Willingness-To-Pay estimation

The survey was conducted face-to-face interviews with the people in libraries and communities of Xi'an. There were 525 available data after eliminating outliers with a 74.67% confidence interval. In Table 2, the descriptive statistics of the WTP responses to the valuation questions can be seen, where the values are presented in RMB per year. The 392 respondents with positive WTP ( $WTP > 0$ ) were split into eight groups, according to the amount of money that they would be willing to pay (1–50, 50–100, 101–200, 201–500, 501–1000, 1001–2000, 2001–5000, and exceeding 5000 RMB). Since there is a rather large share of zero responses, the mean WTP is very sensitive to any extreme responses. And from the equation (1) and (2) the average WTP was 200 RMB per person, per year, the result match the reality residents' consumption of the city of Xi'an.

TABLE II. WTP RESPONSES FOR PUBLIC LIBRARY SERVICE IN XI'AN

WTP (RMB)	Frequency	Percentage (%)
0	133	25.33
<50	12	2.29
50-100	38	7.24
101-200	125	23.81
201-500	107	20.38
501-1000	63	12.00
1001-2000	27	5.14
2001-5000	13	2.48
>5000	7	1.33
Total valid	525	100

#### IV. CONCLUSION

This survey adopted open-ended CVM to measure individual's WTP for public library service. Of the 525 questionnaire sheets that were filled in, more than 25.3% of respondents have no incentive to bear the costs of public library service. The mean WTP for improving public library service quality in Xi'an was estimated to be 200 RMB per person per year in 2009, which is a conservative estimate since respondents who did not give a precise value were excluded from the statistical analysis. Three important factors (average income, education level, and profession) all have significantly positive influences on respondents' decision to pay. The analysis also revealed that gender, age and specialty, which were hypothesized to explain the results, did not actually have a significant influence on the probability of a positive WTP.

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