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# The economic value of the Colombo Public Library, Sri Lanka: contingent valuation approach

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**ABSTRACT**

Net Revenue of a public library is not an indicator of the true value of services rendered by a public library to the wider society. The peoples' perception of the service of the library or economic value is the true value of the library. The Contingent Valuation Method (CVM) used to assess the economic value of a public library which is not a service in the free market economy. This study employs CVM: a branch of the Stated Preference Method to measure the economic value of the Colombo Public Library (CPL) Sri Lanka. The payment vehicle is a Trust Fund. The logistic regression has been applied to estimate the Willingness to Pay (WTP) of citizens which elicited through single bound dichotomous choice question with onetime payment option. The WTP for the population is aggregated by using mean probabilistic logic WTP of the sample. The study found that annualized economic value of the CPL is higher than its total capital and recurrent expenditure per year. Thus, continuation of public funding is acceptable even CPL makes financial losses to the Colombo Municipal Council.

## Introduction

The origin of word "library" has been derived from late Middle English via Old French from Latin *libraria* meaning "bookshop". The term library is defined in Oxford Dictionary (2011) as "a building or room containing collections of books, periodicals, and sometimes films and recorded music for use or borrowing by the public or the members of an institution". Though the public library first appeared by the fourth century BC, the private library was more dominant. Ancient geographer Strabo said "Aristotle was the first to have put together a collection of books and to have taught the kings in Egypt to how to arrange a library" (Canfora, 1990).

Sri Lanka has a proud history of library which commenced with the civilization of society with the philosophical background of Buddhism. Buddhist literature and working "Helatuwaa" (*Buddhist religious literary work*) in the third century B.C. was promoting library system in Sri Lanka and gradually this came to its peak at the time of writing "Tripitaka" (*various canons of scriptures of Buddhism*) in the first century B.C. The evidence

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of formal library system was found in "Anuradhapura" (An Ancient capital of Sri Lanka) with the concept of "Pothgul Vihara" (*place to store books*) which was promoted by Sinhala King Prarakramabahu I (1153–1186 A.D) and managed and uplifted by Queen Chandrawathi; consort of King Parakarmabahu I (Kusummulla, 2011).

The modern library system of Sri Lanka began with "Colombo Library", "Pettah Library" and the "United Services Library". Later United Services Library was merged with Colombo Library. In the year 1925, "Colombo Library" and "Pettah Library" were merged and named as "Colombo Public Library (CPL)" (Kusummulla, 2011). The management arm of the CPL is Colombo Municipal Council (CMC) and it is the one of the largest libraries owned by a local authority in the country and located in the commercial capital (Colombo) of Sri Lanka. Originally, the CPL had three departments; reading room, lending library and reference library. Now it has grown into a library system with fifteen branch libraries, auto-mobile library service, a book box library services and various other services. According to the statistics of the year 2011, the library has 242,658 registered users with a daily average visitation of 1800 (Kusummulla, 2011).

Today, the existence of traditional library system became outdated along with the digital environment which makes fundamental threats to the existence of public libraries. With the high speed internet and advanced information technology, e-libraries are becoming very popular. As a result of that school libraries are being closed down all over the world, public libraries are cutting hours, and research libraries are cutting printed subscriptions to journals and library materials at an alarming rate (Hawkins, 1998).

The analysis of income and expenditure of CPL shows continuous deficit over the period of 2009–2011 years (Table 1). This raised serious thoughts on material benefits over losses of CPL and its services to society. Thus, sustainability of the CPL has been threatened as it shows a deficit in its general account.

Along with growing pressure on public budgets, many library organizations are under the pressure to document their value. As cited by Aabø and Audunson (2002), some rely first and foremost on approaches that can be termed as traditional sociological survey research (Audunson, 2005; D'Elia, 1993). Others use softer methods such as, focus groups either alone or in combination with quantitative surveys (Linley & Usherwood, 1998; Matarasso, 1998). Within social sciences, economists have developed the most sophisticated methods for determining the value of non-market goods such as libraries (Aabø & Audunson, 2002). Whatever the methods applied, it is compulsory that the economic value which is the true value of a library should be estimated to decide whether the public libraries are worthy to be maintained by the responsible organizations.

## The problem

The shrinkage in budgeted funds for libraries is forced to make stand-still budget or close-down of the part of services of public libraries, branches or entire library network. Financing

**Table 1.** Summary of income and expenditure – Colombo Public Library 2009–2011.

| Budget year | Total income (TI) (LKR) | Total expenditure (TE) (LKR) | Deficit (TE – TI) (LKR) |
|---|---|---|---|
| 2011 | 5,375,000 | 77,850,000 | 72,475,000 |
| 2010 | 5,750,000 | 85,350,000 | 79,600,000 |
| 2009 | 4,610,650 | 55,905,461 | 51,294,811 |

Source: (CMC, 2011).

libraries and other public agencies have become increasingly difficult and the competition for public funds becomes fiercer each year for local authority. Further, it is reasoned that there is no value addition to society other than for few readers and users who use library. Thus, closing down the library is supposed to mitigate the financial loss to respective local authority. Library authorities and taxpayers of Colombo Municipality raised this argument having a negative perception on the value of CPL. The central argument is that CMC should utilize taxpayer's money on other priority requirements like utility work instead of investing on library services which seems to be of second priority. This idea stems from the prejudged decision which highlighted that those benefits of the library to the wider society are less than the cost of maintaining them for public uses.

## Objectives

Since the financial cost of the library does not merely represent the true value of services rendered by the public library to the society at large, the study assesses its economic value to review the general public thoughts. Thus, the aim of the study is to assess the economic value of CPL through the application of Contingent Valuation Method (CVM). In terms of the study outcomes, it contributes to better knowledge and understanding of (i) the rupee value perceived by users of the library for various library services and (ii) the economic value (perceived value) against the actual cost to compare cost and benefit of the library.

## Literature review

A public good is one that is available to everyone and which cannot be denied to anyone. Thus, private parties are not interested in investing, protection or enhancement because of the impossibility of recovering the costs from the users or free riders. Public libraries are also possessing similar characteristics and therefore carry the fundamental question on the worthiness of them to society. Therefore, special valuation techniques are required to measure the value of public goods based on the principles of the economic valuation. Economic valuation is a scientific technique of measuring the preferences of people for an environmental good or against an environmental bad. Therefore, what is being valued is not the environment but peoples' preferences for changes in the state of the environment and their preference for change in the level of risk to their lives (Pearce, Mourato, Navrud, & Ready, 2002). Valuation techniques therefore to value both the damage due to pollution and value the services provided by the environment (Tietenberg, 2006).

Revealed preference methods and stated preference methods are two main classifications of environmental valuation techniques. The actual behaviour of people as revealed in the market is taken into consideration in the revealed preference method and stated preference method use hypothetical behaviour in surveys to a hypothetical scenario.

The studies of Benhamou (1996), Frey and Pommerehne (1989), Holt, Elliott, and Moore (1999), Martin (1994), Navrud and Ready (2002), Papandrea (1999), Roche (1998), Throsby et al. (1983), and Frey (1997) noted that CVM as a stated preference method is most suitable for assessing intangible cultural benefits and more appropriate for valuation of nonmarket goods that are familiar to the population. Thus, CVM is identified as method for valuing public library which is a cultural and educational good used by the people.

CVM is used in the scenario or situation where the values for environmental resources cannot be obtained either through the direct market information or through the indirect market information. Accordingly, the value derived under this method is contingent upon the situation of the hypothetical market. This method can be applied to measure both the use and non-use values of the environmental goods. In CVM, it directly asks people how much they would be willing to pay for continuation of specific environmental services (benefits) (willingness to pay or WTP) or how much they are willing to accept as compensation to relinquish specific environmental services (Willingness to accept or WTA). CVM particularly has been used to measure the benefits of wide range of environmental goods which have public good characteristics like recreation, convenience, scenery, everglades, air and water, forest and wild life conservation. The value of services provided to the public by the government like playground, commons, water supply, libraries and thoroughfares also can be measured through this method.

## Methodology

The methodology of the study developed is based on the recommendations of the National Oceanic and Atmospheric Administration (NOAA) and CVM literature. In this section, the study explains the approach on identification of population, sample, CVM questionnaire and the analysis process.

### Population and sample

The economic value of the CPL consists with use value and non-use value. The use value is applicable to direct users of the public library and non-use value is applicable to direct users as well as non-users. The registered users of the CPL are a sub population which used to estimate the use value of the library. There is no clear policy or rule in existence or absence of non-use value in CVM studies (Bateman et al., 2002). Many studies assumed that if non-use value exists, it must exist for all non-users. Accordingly, non-use value should be extrapolated to national population or global population. Libraries around the City of Colombo, other than the CPL are substitutes for CPL which makes limited population for non-use value of CPL. Thus, the context of the study argued that substitution effect reduce the non-use value of the CPL. Accordingly, the aggregation procedure was limited to the resident population of administrative limit of CMC in the year 2011 which is 773,455 (CMC, 2011).

The sample was drawn following a stratified three-step design. (i) Users of the main library (ii) users of selected branch libraries through cluster-based selection considering the user level of the each branch library, demographic structure and geography; and (iii) individuals who live in the city limit. A total of 300 samples were selected with 3.31 of margin of error and 95% confidence level.

### The questionnaire

The questionnaire was designed based on guidelines of NOAA panel for CVM studies. The Part I of the questionnaire was used to identify the respondent's engagement with CPL. i.e. as a registered reader or borrower and frequency of usability. The Part II of the questionnaire

explains the role of the CMC as a facilitator for utility services. The section gives introductory remarks for scenario description for CVM study. The part III of the questionnaire is the main section which deals with scenario description and WTP questions. This section provides a set of information about the characteristics and the current condition of the library. The current condition was presented as the status quo and the respondents were informed that authorities took a decision to close the CPL due to the poor financial performance (show details of Table 1) of the library over its cost. Further, it highlighted the importance of effective utilization of limited funds for other main utility services offered by the CMC. Then the proposed management plan was presented with two options as (i) close down the existing library and allows registration in neighbouring municipality library or (ii) increase the revenue of the CMC through a Trust Fund. It was explained that the Trust Fund would manage the status quo of the library for sustainable future by the independent Board of Management.

Based on NOAA recommendations, the WTP was selected as the conservative choice. Single Bound Dichotomous Choice (SB-DC) format has been selected as the elicitation format for bid amounts. This elicitation format is thought to simplify the cognitive task faced by respondents while at the same time providing incentives for the truthful revelation of preferences under certain circumstances. Therefore, SB-DC format promisingly minimizes non-responses and avoids outliers. This method was validated and endorsed by NOAA (Bateman et al., 2002). The bid values are set after analysing the membership fee structure of CPL and close by two municipal libraries namely; Sri Jayewardenepura Kotte and Dehiwala-Mount Lavinia and two private libraries namely Colombo Library of British Council and American Center Library of Embassy of America and Maldives operated within the Colombo Municipality area. User fee of these libraries vary from LKR 50 to 1000 depending on the membership category. Accordingly, LKR 50, 100, 200, 300, 500 and 1000 was decided as bid value for SB-DC format.

Part IV of the questionnaire is used for follow up questions, to confirm the answer given in previous sections. The respondent's attitude on use value and non-use value of the CPL is reviewed by the Part V of the questionnaire. The Part VI and VII are used to identify respondent's perception on scenario description and validity of the questions of the CVM questionnaire. The part VIII includes questions on the socioeconomic and demographic characteristics of the respondent's namely; age, education, job category and income. The socioeconomic data are used as dependent variable for the model to ascertain the representativeness of the survey sample relative to the population of interest and to study how WTP varies according to respondent's characteristics. The Part IX is used to extract interviewer's perception of the survey.

The study facilitates with pilot study and redefines questions of original bid values based on the results of the pilot survey.

## The survey

The survey was carried out during the months of June–August 2011 by trained interviewers at different locations of the main library including reading, referencing, borrowing sections, cafeteria and outside the library premises. Further, two selected branch libraries were also visited to meet respondents and distribute questionnaire. The survey was interactive in nature with visual cards to clearly explain the existing situation of the library and proposed

hypothetical scenario of the CVM to respondents. To meet different user groups of the library, the study covered all 7 days from 8.00 am to 6.00 pm including long weekends and school vacations.

### Empirical model on estimation of mean

Scholars widely use parametric methods due to the dual capability of calculating WTP as well as identifying the determinants of respondents' WTP (Weligamage, 2011). The success of parametric methods depends largely on accurate specification of probability distribution of WTP. Commonly used parametric methods include the random utility model (Hanemann, 1984) and random willingness to pay model (Cameron & James, 1987). The study used random willingness to pay model (Cameron & James, 1987) for this estimation.

The Part III of questionnaire first inquires whether the respondent is for or against the Trust Fund, and if yes, then probing on WTP value for the Trust Fund. The choice is given out of defined bid values. Information elicited through SB-DC format was used to estimate the mean WTP of the sample. Following the Cameron and James (1987) and Weligamage (2011) the study used the binary indicator variable as the dependent variable which is agreement (Yes) or disagreement (No) for Trust Fund, and a vector of respondents' characteristics augmented with bid values as predictors. Accordingly the WTP offer (Yes/No) was considered as the dependent variable of the study and socioeconomic information of the respondent and accepted bid value considered as the independent variable for the model. The reference category of each variable is the first sub variable; which is used in interpretation of reference for determinants for logistic model and determinants in WTP model. The estimated parameters $\alpha$, $\rho$, and $\lambda$ are subsequently used to recover parameters to predict probabilistic logic WTP for each respondent using,

$$Y_i = \text{WTP} = \omega + \beta_s Z_{is} \text{ for } i = 1, 2, 3, \ldots \ldots H.$$

where $\omega = -(\alpha/\rho)$, and $\beta_s = -(\lambda_s/\rho)$. The estimated $\beta^*$ vector represents marginal WTP in increase of one unit of each explanatory variable. Variances of $\beta_s$ and $\omega$ are computed using the formulae suggested by Kmenta (1971) and used by (Cameron & James, 1987).

Variance $\omega$ is computed by replacing $\lambda$ in last equation by $\alpha$. Based on Samuelson (1954) the economic value of the society's WTP is obtained by vertical aggregation. Aggregation of economic values of the CPL was done by satisfying the (i) the population of interest has been chosen as resident population in Colombo (ii) the unit of observation agreed as individual responses, (iii) a random sample of those units has been drawn with each unit in the population having known and positive probability of inclusion in the sample, (iv) all the units chosen for the sample agreed and interviewed, and (v) mean WTP chosen as statistic of interest in the final formula.

The WTP for the population of interest is calculated using estimated mean WTP of the sample and total population size ($N$) using

$$\text{Aggregate WTP} = N * (\text{mean probabilistic logic WTP})$$

### Results and discussion

According to the data revealed by Part I of the questionnaire there are three main groups of users of the CPL. Namely; (i) frequent users who use library services at least once a week,

Table 2. Annual total expenditure of the Colombo Public Library.

|  | 2011 | 2010 | 2009 | 2008 |
|---|---|---|---|---|
|  | LKR | LKR | LKR | LKR |
| *Expenditure* |  |  |  |  |
| Total revenue expenditure | 70,750,000 | 74,250,000 | 54,704,939 | 57,990,916 |
| Total capital expenditure | 7,100,000 | 11,100,000 | 1,198,515 | 723,936 |
| Total expenditure | 77,850,000 | 85,350,000 | 55,903,454 | 58,714,852 |
| *Income* |  |  |  |  |
| Facilities | 2,370,000 | 2,170,000 | 1,971,693 | 1,905,620 |
| Recoverable charges | 2,500,000 | 3,000,000 | 2,178,700 | 2,985,309 |
| Sales | 105,000 | 80,000 | 90,458 | 66,307 |
| Interest | 400,000 | 500,000 | 0 | 477,987 |
| Total revenue | 5,375,000 | 5,750,000 | 4,240,851 | 5,435,223 |
| Surplus/(Deficit) | −72,475,000 | −79,600,000 | −51,662,603 | −53,279,629 |

Source: (CMC, 2011).

(ii) non-frequent user who visits the library at least once or twice per quarter and (iii) non users who do not visit the library within last quarter. 49 per cent of the sample represent Frequent User category. 30 per cent and 21 per cent of the sample belongs to Non Frequent User and Non User category, respectively.

### Financial cost and revenue of public library services

Funding organization of the CPL is the Library Department of CMC. During the financial year of 2011, total of LKR 77.85 million capital and recurrent expenditure and LKR 5.375 million income was accounted by the CPL. The income sources are supply of facilities, recoverable charges and sales and interest (Table 2).

It is evident that CPL had LKR 72.475 million net deficit for the year 2011 in providing library service to the citizens of Colombo.

Proposed hypothetical scenario highlighted the above explained net deficit and its financial impact to the municipality and starts reasoning out the scenario. Out of the two proposed hypothetical options in the questionnaire which is (i) close down the existing library and allow registration in neighbouring municipality library or (ii) increase the revenue of the CMC through a Trust Fund to minimize the financial burden to the municipality, 77 per cent of the respondents prefer to have Option II with total of 231 valid acceptance. Only 23 per cent agreed to close down the library.

### WTP analysis

The in-depth review of these 69 respondents (which are 23 per cent) who opposed the Trust Fund and agreed to close down the library revealed that 40 protested due to their poor economic background. However, balance 29 does not have any personal financial constraints but opposed to contribute to Trust Fund to manage the library. As a result, those who protested the Trust Fund due to economic constraints were considered as true zeros (with WTP value of zero) and included into the WTP analysis while 29 others were identified; as outliers and excluded. This makes the active sample of 271 respondents for analysis.

Bid values for WTP offer ranges from LKR 50 to LKR 1000. Offer values are more equally distributed in every category of offer. Kruskal–Wallis H Test has been used to verify the impact of place of interview on the accepting WTP bid offer. The Chi-Square of 53.49 and df

of 7 with Asymp. Sig. .329 shows that there is no statistically significant difference between place of questionnaire survey and the acceptance or rejection of the bid offer.

The raw figures on "P value of Estimates" and "Marginal Effects" on levels of the binary logistic regression were not analysed in detail; the sign and marginal odd ratios are paramount when interpreting data on determinants of WTP for the library. As predicted (Weligamage, 2011) the parameter estimated for the bid value is negative with the significant level of zero. The marginal effect of age, profession and gender of the respondent shows insignificant contribution. The study found that there is no significant variation of WTP contribution for CPL Trust Fund due to the variation of age, profession and gender.

Literature review on CVM study showed that user status and education has positive influence on WTP (Alberini, 1995). Also Weligamage (2011) pointed out that distance to environmental/social goods would negatively influence WTP value since visits to distant destination make lower utility to the respondent with diminishing marginal return. The study observed user level has positive contribution with diminishing return. Thus, probability on contribution to WTP has diminishing impact of .44 to .02 when user status changes from non-frequent user to non-user where both are significant at .05 level (Table 3).

The probability on WTP contribution decreases when the level of the profession is increased, which is a controversial observation compared to CVM literature (Aabø, 2005; Weligamage, 2011). The non-significance of marginal effect for profession indicates that the decision to contribute for CPL Trust Fund is not influenced by the profession. All citizens equally contributed to the fund irrespective of the profession that they are engaged in. It coincides with the gender and the frequency of visits to the public library; respondent's gender is not significant at .1 level which gives marginal contribution to the final model.

Marginal effect of respondent's age is significant at the level of .1; indicates increasing probability of WTP along with the increasing age; however contradicts with CVM literature. Weligamage (2011) and Horowitz and McConnell (2002) pointed out that when respondent's age increases his/her commitments and responsibilities increase. This contradictory behaviour of the respondents confirmed their perception on the value of knowledge. The

**Table 3.** Parameter estimates for binary logistic model ($N$ = 271).

| Parameter | Variable | $\beta$ | $p$-value of estimates | Marginal effect | Sig. |
|---|---|---|---|---|---|
| $\alpha$ | Constant | .0531 | .1567 | | .9633 |
| $\rho$ | BidAmout | −.0035 | .0000 | −.0010 | .0000 |
| $\lambda 1$ | User(2) | 1.4698 | .5998 | .4482 | .0143 |
| $\lambda 2$ | User(3) | 1.4807 | .5330 | .0231 | .0055 |
| $\lambda 3$ | noofvisits | .0149 | .0072 | .0561 | .1380 |
| $\lambda 4$ | Prof.(2) | −2.3906 | .5186 | −.3991 | .1154 |
| $\lambda 5$ | Prof.(3) | −1.6189 | .9510 | −.2109 | .1887 |
| $\lambda 6$ | Prof.(4) | −1.6753 | .6030 | −.1741 | .1555 |
| $\lambda 7$ | Prof.(5) | −.6259 | .4691 | −.0782 | .1821 |
| $\lambda 8$ | Income(2) | 1.5812 | .4089 | .2186 | .0417 |
| $\lambda 9$ | Income(3) | 1.8926 | .8075 | .0156 | .0191 |
| $\lambda 10$ | Income(4) | .5067 | .4828 | .0163 | .2939 |
| $\lambda 11$ | Fam(2) | −.8977 | .7688 | −.2201 | .2430 |
| $\lambda 12$ | Fam(3) | −1.6274 | .7357 | −.0262 | .0270 |
| $\lambda 13$ | Age | .0197 | .0160 | .3223 | .5463 |
| $\lambda 14$ | Edu(2) | 1.5738 | .6621 | .0001 | .0174 |
| $\lambda 15$ | Edu(3) | .6528 | .3685 | .009 | .0765 |
| $\lambda 16$ | Gender(2) | .0943 | .3668 | .1112 | .7971 |
| $\lambda 17$ | Dis(2) | 3.5490 | .6441 | .3184 | .0000 |
| $\lambda 18$ | Dis(3) | 1.5409 | .6053 | .0489 | .0109 |

Source: Survey data (2011).

life style of elderly persons who have adequate time for reading and leisure gives high probability on WTP value of the library.

Higher income groups have significant level of .05 on contribution to WTP with reducing probability of .21 and .01 for household's monthly incomes of "LKR 10,000 – 19,999" and "20,000 and 29,999" category, respectively. This phenomenon is again controversial to typical CVM studies. Jacobsen and Hanley (2009) have identified similar nature in biodiversity conservations. The argument to confirm this phenomenon is the power of income to buy all reference books and related information for personal use which leads to low WTP placements.

The respondents with a status of graduate has .009 of marginal probability in WTP for CPL Trust Fund, with significant at .05 level. The study found that there are no considerable changes on probability value and contribution with the respondents having educational qualifications of G.C.E Advanced Level and the Diploma Level. This identified as a momentous result of the study where graduates value the knowledge much more than the rest of the respondents. Equally the study confirmed that graduates have higher level of income earning capacity compared to the others which naturally contribute them on higher value.

Increase in number of family members makes prioritization on family expenses and makes negative impact on WTP value. It was also confirmed that distance to the public library would negatively influence on WTP, since visit to the public library by-passing many other similar libraries decrease the utility of the respondent. This phenomenon is noted in Aabø (2005) and by (Weligamage, 2011).

The standard errors on WTP estimation were calculated to measure the contribution of each parameter for mean WTP value (Table 4). The parameter estimation for WTP value can be interpreted as marginal contribution of each parameter towards WTP for the library. Number of visit by the user makes a positive contribution of LKR 23.19 WTP value for each visit and income category of LKR 30,000 and above, contributes at LKR 101.11 at marginal

Table 4. Parameter estimates for WTP function ($N = 271$).

| Parameter | Variable | Estimate | Contribution to WTP at data means (LKR) |
|---|---|---|---|
| $\omega$ | Constant | 15.17 | 15.17 |
| $\beta1$ | User(2) | 419.94** | 231.61 |
| $\beta2$ | User(3) | 423.06* | 128.52 |
| $\beta3$ | No of visits | 4.26 | 3.19 |
| $\beta4$ | Prof.(2) | −683.03 | −165.09 |
| $\beta5$ | Prof.(3) | −462.54 | −87.09 |
| $\beta6$ | Prof.(4) | −478.66 | −76.45 |
| $\beta7$ | Prof.(5) | −178.83 | −28.78 |
| $\beta8$ | Income(2) | 451.77** | 211.99 |
| $\beta9$ | Income(3) | 540.74** | 378.01 |
| $\beta10$ | Income(4) | 144.77 | 101.11 |
| $\beta11$ | Fam(2) | −256.49 | −109.03 |
| $\beta12$ | Fam(3) | −464.97** | −227.42 |
| $\beta13$ | Age | 5.63 | 8.15 |
| $\beta14$ | Edu(2) | 449.66** | 276.30 |
| $\beta15$ | Edu(3) | 186.51** | 104.72 |
| $\beta16$ | Gender(2) | 26.94 | 12.41 |
| $\beta17$ | Dis(2) | 1014.00 | 471.52 |
| $\beta18$ | Dis(3) | 440.26 | 112.84 |
| Mean WTP | | | 1361.68 |

Source: Survey data (2011).
*$p \leq 0.05$; **$p \leq 0.01$.

**Table 5.** Aggregation of WTP – TEV of Public Library in Colombo.

| Description | Value |
| --- | --- |
| Mean sample WTP (LKR) based on the probability logistic regression model | 1361.68 |
| Total population of CMC in 2011 (estimated) | 773,455 |
| Aggregate WTP (LKR) | 1,053,198,204.40 |
| Total economic value for residents of Colombo | 1,053,198,204.40 |
| Annualize: interest rate (inflation adjusted)* | 10 |
| Annual total economic value in millions (LKR) | 105.32 |

Source: Survey data (2011).
*Central Bank of Sri Lanka average inflation-adjusted interest rate for money deposits (2011).

WTP value. Also a respondent who belongs to a family who have more than five members shows negative contribution for WTP function of LKR 27.42.

The logistic regression model has run based on the reference category of the dependent variable to estimate the impact of each depended variable on mean WTP value (Table 4). According to the binary regression model and the individual impact on WTP bid the mean WTP for CPL Trust Fund can be estimated as LKR 1361.68 with onetime payment option.

### Aggregation and economic value

The aggregation process of the economic value of the CPL derives applying the empirical model on estimation of mean WTP using probabilistic logistic regression function. Estimated probabilistic WTP for sample is LKR 1361.68, which is used to estimate the economic value of the population. The economic value of the library is derived as indicated in Table 5.

This aggregation procedure follows vertical aggregation and estimates economic value of the CPL as LKR 1053.19 million for the perpetuity period of time with onetime payment option for WTP question. This perpetual value was annualized at a rate of 10 per cent based on time value and applying social discount rate for social goods (Harrison, 2010; Zhuang, Liang, Lin, & De Guzman, 2007) to estimate annual economic value of the CPL. The annualized value is recorded as LKR 105.32 million. This is identified as the annual social contribution by the CPL for residents of Colombo Municipality compared to its annual cost of LKR 77.85 million. Thus, it is evident that the economic value of the CPL is 1.35 times higher than its annual cost. As a result, estimated benefits to the citizen emanating from economic values are about 1.35 times that of annual cost of CPL.

### Conclusion

The physical existence of libraries provides opportunity to disseminate wider spectrum of service to the community, thus the mere evaluation of the cost of maintaining a library does not provide its true representation of economic value. The economic value includes both use value and non-use value which represents the true value. Hence, calculating the cost of maintaining the CPL underestimates the true value of the services provided to the society which provides erroneous guidance and information to the decision makers and policy makers. The values for maintaining the library services of the CPL considered both use and non-use value which was estimated referring to the intrinsic benefits, i.e. those deriving from mere existence of the CPL. As per the CVM study the mean WTP of the

sample is LKR 1361.68 which indicates that the respondents agreed to contribute LKR 1361.68 for the CPL Trust Fund. Accordingly, the present value of the contribution made by the total population is LKR 1,053,198,204.40, mounting to Rs. 105.32 million of annual value of the library. Hence, the CPL makes a surplus of LKR 27.47 million compared to the annual cost of LKR 77.85 million. Based on these findings the study argued that the CPL makes positive contribution to society thus its value cannot be judged merely on the basis of cost of maintenance and its revenue.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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