

## PUBLIC LIBRARIES' SERVICES AND THEIR ECONOMIC EVALUATION

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**Abstract:** *The goal of public library is to meet the cultural, educational, and social demands and requests of local society by providing information services to their residents. Economic valuation of public libraries is being carried out more frequently in recent times. Since the mid-nineties researchers attempted to quantify the value of library services and asked users of these services for their opinions regarding the performance of public libraries. The economic value of public libraries for local residents in Czech Republic was measured in this paper. Data for the analysis were collected from 37 public libraries in the Czech Republic. The public libraries' benefit/cost ratio was calculated and it is 5,86 – 6,17 %. That means, for every \$1.00 spent on analyzing Czech public libraries, provides on average \$6.00 benefit value to taxpayers. The resulting value (\$6.00) is quite comparable to results from similar studies conducted in other developed countries. It was also found that the library size does not affect the final value of the public libraries services, thus the efficiency of spent public funds is comparable in both large and small libraries.*

**Keywords:** *Contingent valuation, Public Services, Public Library, Return on Investment, Cost Benefit Analysis.*

**JEL Classification:** *E62, H41.*

### Introduction

Effectiveness is currently increasingly becoming a discussed concept. In a market environment, the allocation of resources is consistent with the evaluation of economic performance and effectiveness of the activities of the business units. Penetration of market-based approaches into the public sector entails assessing the effectiveness of the activities of public sector organizations. Providers of public funds consider very carefully which organizations that should be allocated public resources for delivering public goods and services.

It is common ground that libraries are extremely valuable institutions providing broad mass of public services to their customers. The goal of a public library services is to meet the cultural, educational, and social demands and requests of local society by providing information services to residents (Ko et al., 2012).

Outcomes of public libraries are its benefits or services provided to its users (Vakkari, Serola, 2012). Their value is more complex in the public sector than in the private sector and can therefore be harder to measure (Bloch, Bugge, 2013). The public services provided by libraries are often referred to be a „hardly appraisable service“. Generally, it is always difficult to quantify outcomes in the form of non-financial benefits, among which we can undoubtedly include also library services. In spite of this fact, the current state of international knowledge already provides methods for the quantification of these "hardly appraisable" services. Thereby methods for

evaluation of public performance, such as public library services are provided. Providers of public funds can gain valuable information for decisions making about the allocation of public funds. Common features of these existing approaches are that they were performed in limited number of developed countries.

The aim of this paper is to quantify the economic value of public libraries for local residents in the Czech Republic. The method of cost/benefit analysis (CBA) will be used, as it allows demonstrate the efficiency of public investments to public libraries.

## **1 Statement of a problem**

Many international studies show that there are appropriate procedures that can define the output of public service and appreciate its usefulness for its users. The first approaches for evaluating library services appeared already in 1980 (Aabø, 2005; Holt, Elliot, Moore, 1999). All studies faced a problem of difficulty in measuring the output values of public service. It was found that the economic value is not a synonym to financial or business value. Trosby (2003) believes that it is a monetary expression of utilizable value of cultural goods or services which do not include non-market value.

Economic impact analyses usually use methods which are insufficient for evaluating the economic value of library services. Specific analytical methods must be used which result from analysis of utility coming from the provision of public service. Further, this utility has to be compared with costs that are spent on the realization. It is a kind of analysis similar to “return on investment” as the outcome is an approximate determination of a value which is created by spending one public monetary unit.

When determining the value of a public service, it is very difficult to express the monetary value of some provided services and express the utility of individual users and whole society. Presently, there are a number of approaches to determine the value of various impacts resulting from consumption of public services. Many of them are based on the availability of market valuation substitutes; another large group is based on the consumer's ability to determine the subjective value of consumed services.

Many economic studies on the value of public libraries use the contingent valuation method, which was developed in 1947 (Cummings, Taylor, 1999), to provide an estimate of the value of services when users receive those services for free. CV surveys ask users what they would be willing to pay for a service (WTP questions) and willing to get access elsewhere to the information resources they recently received from the library (WTA questions). This method allows researchers to calculate the average user-assessed value of access. The contingent valuation method is a widely used nonmarket valuation method especially in the areas of environmental cost (Venkatachalam, 2004), health care (Klose, 1999), public libraries (Stejskal, Hajek, 2015). CV principle is the basis of a method that is still used today in practice – contingent valuation method (CVM). The CVM is a survey-based technique generally accepted as a meaningful tool used to estimate the value of various nonmarket goods (Lee, Chung, 2012); it reflects altruistic motivation, a major component of non-use value in contingent valuation. This method gained popularity after the two major non-use values, namely, option and existence values have been recognized as important components of the total economic values (Venkatachalam, 2004). For methodology of

contingent valuation please see (Russell, Fox-Rushby, Arhin, 1995; Walsh, Greenshields, 1998).

### **1.1 Development of methods for assessing the value of public services**

Methods of determining the economic value of public services can be further divided into two groups based on monitored services and library performance (Missingham, 2005).

The first group of used methods can be described as “study of efficiency” or study oriented on output. These studies determine value based on operational efficiency in the management of human and material resources. These types of evaluation analyze cost and demonstrate the outputs reached with used cost. By comparing those two variables, relative efficiency is shown.

Many providers of public services use benchmarking in this context. Thanks to the application of this method, management is able to compare results and improve processes continuously and thus realize cost-cuts. Studies show that providers are able to effectively manage and use their financial resources. However, these studies do not provide managers or other interested parties information which directly demonstrates that they are offering and providing the right mix of services, or that they derived specific benefits from the existence of concrete public service.

The second group of the method brings a broader perspective on the value of public services. The methods used in these studies are trying (a) to determine the social value of providers and (b) to highlight the justification of the of public services provision existence, primarily for the owners (the political representation of the city, region, state and citizens - stakeholders). In this context, the balanced scorecard method is used. It provides concrete data that can be used to set targets and their subsequent evaluation.

The crucial shift can be seen in new analytical methods based on the use of contingent valuation method. These methods allow cost-benefit analysis (CBA) application or “return on public investment” (ROI) calculation (Carson, 2012; Marella, Raga, 2014). Both methods are now new. They are used to find the value of services by defining benefits and costs through consumer’ perception of a good service.

### **1.2 The results of studies measuring the value of public libraries**

Studies about the measurement of public economic value in the case of library services have been performed by the St. Louis Public Library, the State Library of Florida, Toronto (Martin Prosperity Institute, 2013) and the British Library (London Public Library, 2015). Diverse techniques for inducing value amounts have been used depending on the circumstances or research conditions for each library. Number of authors used auxiliary tools such as payment cards in their studies (Ko et al., 2012; Harless, Allen, 1999; Mcdermott 2002; Pyo, 2006). The British Library and other public libraries in the United States examined the amount of the WTP by asking open questions (Holt, Elliot, Moore, 1999; OECD, 1996). The split-sample method was used by (Aabø, 2005) with two value elicitation question formats to minimize sampling and to correct the elicitation method’ effects. The following studies present the results of cost-benefit methods (B/C ratio or ROI) of public library services.

One of the newest researches from the area of public library services and their performance was carried out in Florida (Haas Center, 2013). It is also the largest research, because they started with the pilot project in 2004, continued in 2008 and the last one was in the year 2013. The total value of ROI was \$6.54 dollars per \$1 of libraries expenses in 2004, \$8.32 per \$1 in 2008 and \$10.18 per \$1 in year 2013. In other words, taxpayers in 2013 invested \$496 million, but received an economic benefit of approximately \$5.55 billion. It follows that during the eight years there has been an increase in ROI of 3.64 dollars, which is an increase of 55%.

One of the last researches was made in the U.K. in 2015 (London Public Library, 2015). The results of London' Public Library's economic impact study clearly demonstrate that London' Public Library delivers a strong Return on Investment. Through the delivery of library services that enhance London's competitiveness and prosperity to contribute to a better quality of life for all. For every dollar invested, Londoners received \$6.68 in value.

Studies about the measurement of value for the users of public libraries, all around the world, are shown in table 1, as well as the methods which were used and the values of effectiveness for each library. Overall, the taxpayer's return is calculated to be \$ 2,3-10.18 for every \$1.00 invested during the period 2006 and 2015. Another study was made in 2015 but it was in University Library in Syracuse, where the economic and environmental value shows \$ 4.49. Probably one of the newest studies made in 2016 in the Malaysian technical university library proved the libraries' value to be \$ 1,28. But these academic libraries have different types of financing, so for this reason it was not included in the studies shown in Table 1.

**Tab. 1: Review of studies dealing with the determination of the value of public libraries in the years 2006 – 2015**

Year	Place/country of research	Methods	Result (in \$)
2006	Pittsburgh	ROI	3,09
2008	Florida	ROI	8,32
2008	Illinois	ROI	4,38
2009	Colorado	ROI	4,99
2011	Victoria	B/C	3,56
2012	Queensland	B/C	2,3
2012	Lithuania	B/C	5,77
2012	Korea	ROI	3,66
2013	Florida	ROI	10,18
2013	Toronto	ROI	5,63
2015	London	ROI	6,68

*Source: own processing according to Stejskal et al. (2013)*

## 2 Methods

Cost-benefit analysis (CBA) is the most used means of characterizing the benefits that accrue to communities when they provide tax support to public libraries. The sense of CBA is to quantify and compare total benefits (of both library users and the whole society) and costs of public libraries on providing individual services. While

costs are easy to calculate, benefits are not. From the economic point of view, this CBA represents a standard method to measuring the net economic surplus from market goods or services (Aabø, 2005, 2009).

Input data - costs for providing evaluated portfolio of the public services - into the cost/benefit analysis were obtained from the accounting system of every library. Output data – utility are measured by CV method. It depends also on the number of customers, number of book loans etc., which were obtained from the KULT report (normalized statistical statement generated from every library in the Czech Republic). In CBA we are evaluating also the measurement of secondary economic impacts, the library's impact on the rest of the economy can be also calculated, e.g. its contribution towards employment, income, consumption expenditures, and state or local government revenue in the form of taxes. Economic impact studies are an established methodology in economics (Aabø, 2009).

CBA method has much strength for which it was chosen for the analysis. CBA allows defining all the benefits and costs of implemented actions. Secondly, CBA should show broad consequences (positive or negative) that impact on the whole group of consumers or even the whole society. The final reason for using CBA is due to the fact that it is as objective as possible. It does not permit the inclusion of some benefits or cost. It represents a "democratic element". To ensure objectivity, the whole process must be transparent and can be communicated with the whole public. Method solves so-called well-being and contributions of various projects to increase it.

### **3 Problem solving**

Public libraries play an essential role throughout the communities in which they operate. Though traditionally considered havens for recreational readers, today's libraries have expanded their roles by providing information and community services. Public libraries have become centers of emerging technologies, offering vast array of Internet resources, access to technological equipment and hours of technological instruction for the public. In addition to material resources, public libraries offer guidance, expertise and support through the army of library staff that serve residents throughout the state.

An economic value measurement model that enables the estimation of diverse types of public library services was designed, using a contingent-valuation measurement method. Benefits were taken as the value of the main services provided by public libraries, such as accessibility to informational materials, facilities and programs. Costs included the total amount of expenses at libraries such as personnel expenses, materials purchasing expenses and other operational costs.

#### **3.1 Data Collection and Pre-processing**

With the survey of the project "*Methodology of measuring the value of library services*" in 2011, selected Czech libraries began to be evaluated from the point of view of their effectiveness.

The respondents were only readers of the Municipal Library in Prague (MLP). The total number of members of the panel questionnaire was the 1061 (answered only 374). Individual respondents were randomly selected from a panel of readers aged 15+. The question forms were sent out during October and November 2011 by the intranet of MLP.

During the year 2012 another empirical survey was realized. The qualitative and representative survey was conducted in July and August 2012 with the help of an on-line questionnaire (CAWI). 11,397 randomly selected readers of the MLP library were addressed. These readers were older than 15 years, said in their application an email and they used of library services in the last quarter before receiving the questionnaire. Return of the survey was 20 %, after cleaning the data file which consisted of a basic set of 2,227 respondents.

Evaluating the effectiveness of libraries within the project "*Lucky number for the library*", followed the previously mentioned projects of MLP. The data obtained from the service users has been applied to calculate the CBA in 37 libraries in the Czech Republic in the period 2012 - 2014. It is probably the most comprehensive study looking at this issue in Central and Eastern Europe.

Ways of putting questions were similar to those from foreign studies, which used the mentioned methods WTA and WTP to determine respondents' opinions on the value of library's services. Part of the questions was conceived independently of the contributor (Stejskal et al., 2013). The questionnaire determining the perceived value of selected services provided by the library was first subjected to pilot testing so that individual questions were understandable for readers and the questions were able to be answered. At the same time, it was drawn up so that neither the way questions were phrased nor their order influenced the readers; this ensured a high degree of predicative ability and that the valuation obtained for the individual services would be realistic. The experiences published by (Venkatachalam, 2004) were used here.

WTP and WTA questions inquiring the value of public library services to the respondents were:

**Question 1a):** *If you consider borrowing, information or other services you have received or used during your last visit, did library save your money?*

**Question 1b):** *How much money did the library save to you?*

**Question 2:** *If you had no access to the library, will it complicate your life somehow?*

**Question 3:** *How much would you have to pay in case you cannot use the library and have to use any other alternative. (Add please e.g. travel cost, price for access to materials etc. for the whole year.)*

*Also questions on tax assignation, which allows hypothetically decide how to use taxes paid by the respondent, were included into the questionnaire:*

**Question 4:** *If you could pay less tax by the annual contribution paid to the library, how much would you be willing to contribute to the library?*

**Question 5:** *If it would be possible, how much of 10,000 CZK paid on taxes would you give on the annual contribution to your library?*

### 3.2 Cost-benefit analysis of Czech libraries

The CBA analyzes were categorized into the size of library. All libraries were divided into three groups depending on their number of registered users: large (70.38 % of total registered users), medium (19.74 %) and small (9.88 %) libraries. Data regarding the registered users as of December 31<sup>st</sup>, 2014 were obtained from the KULT report of each library. The results of estimating the CBA by library size are shown in Table 2. The B/C 2014 of large libraries was 6.17, the CBA 2014 of medium sized libraries was 5.86 and the B/C 2014 of small libraries was 6.07. The B/C value of medium-sized libraries was the highest. However, the analysis shows that there is no big difference in the B/C values due to the difference in library size.

As a result of measuring the total value of public libraries in the Czech Republic in the CVM, the final B/C ratio for the year 2014 was estimated as 6,03. This result is comparable to the values of studies all over the world (see Table 1).

**Tab. 2: Diversification the value of B/C 2014 by library size**

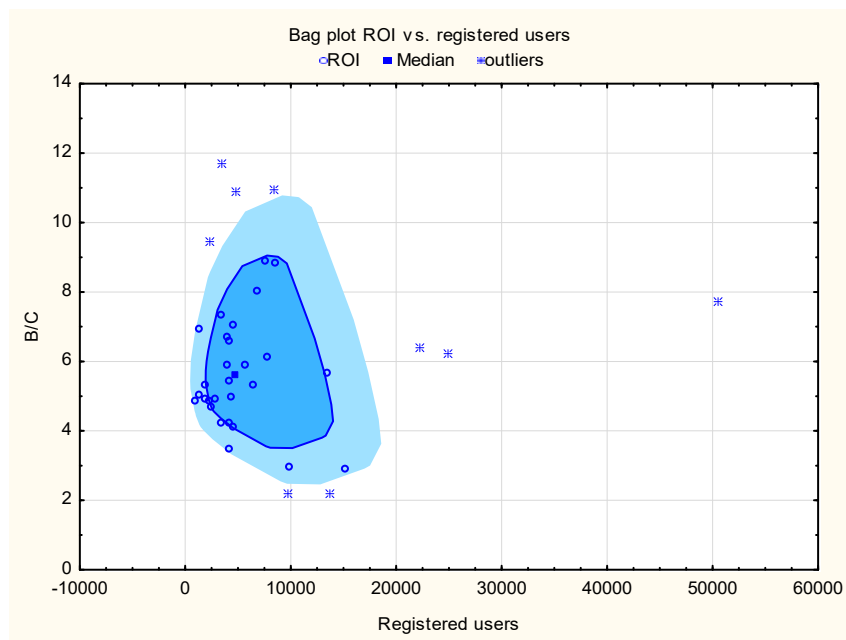
Library size	Total number of registered users	Avg B/C
Large (13)	199123 (70.38 %)	6,17
Medium (12)	55832 (19.74 %)	5,86
Small (12)	27958 (9.88 %)	6,07
Total (37)	282913 (100.00 %)	<b>6,03</b>

*Source: own processing*

For the graphical interpretation of the examined variables we used the so-called Bag plot created in Statistica program. Bag plot is a generalized two-dimensional graph, which serves the graphic interpretation of statistical data. Points in the graph represent a combination of dependent and independent variables of individual countries. Dark blue area (i.e. Bag) contains 50% of surveyed countries (between the first and third quartile) and dark blue square represents the median values of the examined countries. Light blue exterior bag contains other rated states that achieve different values than countries in the dark blue field, but are not outliers. Outside of this area there are outliers that are shown in the chart with small stars. Bag plot shows the relationship between the evaluated variables indicated by the orientation of the bag (positive slope of bag indicates a positive relationship between the evaluated variables and negative slope of bag suggests the negative relationship).

Figure 1 shows a bag plot of examined libraries. On the x-axis there are the numbers of registered users and on the y-axis there are the B/C values. Bag plot in Figure 1 shows that the size of the library, according to its registered users, does not affect the value of B/C value. The efficiency of the library is not affected by its size.

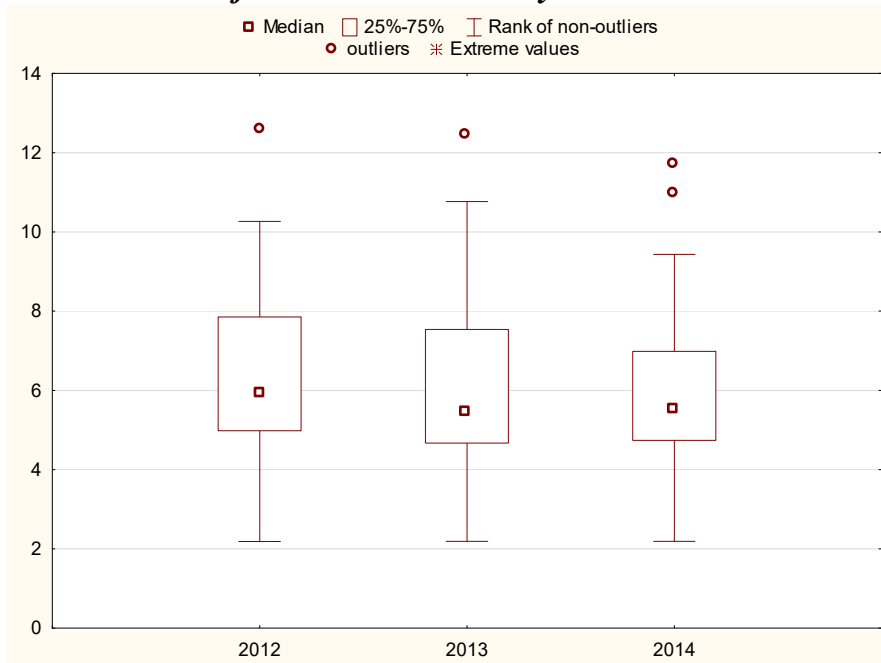
**Fig 1: Bag plot chart with relation between the value of B/C 2014 and registered users**



*Source: own processing*

Figure 2 shows the differences in the result values of analyzed 37 libraries in the years 2012, 2013 and 2014. The median in 2014 compared with previous years decreased; therefore there are smaller differences in reached B/C ratio of analyzed libraries.

**Fig 2: Chart with median differences between the years 2012 - 2014**



*Source: own processing*



Outliers in the graph represent libraries that received significantly higher ratings than others in the reporting year. From the graphical representation, it is clear that some Czech libraries reached B/C values even higher than 10 or 12.

This significantly higher value of B/C achieved libraries, regardless of their size. In these exceptionally evaluated libraries we can find small, medium and large libraries as well. Such a finding merely confirms that the resulting value of B/C does not depend on the size of the library and even a small library with a low number of users can produce the same value of public service as the big ones.

## **Discussion**

The significance of the existence of public libraries and their influence on the economy of a particular region and the whole state can be documented by added value which the libraries create and by their activities which influence the society. Measuring the value of public libraries service requires a broad a considerable attention.

Czech libraries began to be evaluated from the point of view of their effectiveness in 2011, when the project "Methodology of measuring the value of library services" started. The "Lucky number for the library" project continues until today and is the only project providing valuable data needed to quantify the value of Czech public libraries services. The mentioned project has more and more participants from the libraries themselves every year. That means that the management of participating libraries realizes the importance of evaluating their performance. The project brings the Czech public libraries closer to foreign libraries whose effectiveness and activities have long been evaluated for many years. Despite the significant time delays, Czech libraries got very positive results.

The results of analyzed foreign studies confirm that public libraries generate public services within the range of values \$ 2.3 -10.18 for every \$1.00 invested during the period 2006 and 2015. In 2014 Czech libraries generated \$ 6 for every \$1.00 invested. Conclusions of the analysis are consistent with many foreign surveys, e.g. (Haas Center, 2013; Ko et al., 2012; London Public Library, 2015; Martin Prosperity Institute, 2013; Pyo, 2006).

Thus, thorough and continued management is required in order to maintain the accuracy of statistics on public libraries, including statistics on the use of public libraries. Furthermore, strategic endeavors are needed that help make subsequent more precise studies by subcategorizing statistical categories.

## **Conclusion**

The methodology of Cost/benefit analysis calculation for public service systems is a very valuable tool for regional providers of public services and their investments. It will no longer be a question of making standard decisions under conditions of high uncertainty, applying this methodology will reduce the uncertainty.

Libraries feel increasing pressure to demonstrate their value to their communities. These institutions face a greater competition, rising costs, lower budgets and greater pressure to demonstrate their success. The value demonstrated by a Cost/Benefit study

can be leveraged within the institution to advocate for the library budget. It can also reveal the relative effectiveness of library services contributions toward institutional outcomes, determining which should be prioritized or improved.

In the international standards IFLA, libraries are categorized according to the number of titles, size of area etc. None of the IFLA standard does sort public libraries according to the number of registered users. Performed analysis showed that the value of B/C in the analyzed 37 Czech libraries with different numbers of registered users does not differ. The analysis thus showed that the efficiency of the library is not affected by the number of users. For a library with a small number of readers, every \$1.00 spent brings back to the taxpayers almost the same amount like a "big library". The resulting total value of 6.03 is quite comparable to results from similar studies conducted in other developed countries.

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