

***Return on Investment of Municipal Libraries
Network of the Barcelona province
(2007-2011)***

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Index

1. Approach and aim of the study	5
2. Literature review	6
2.1. Direct and indirect benefits	6
2.2. Methods to estimate benefits	7
2.3. Social Return on Investment	9
3. Development of the study	9
3.1. Description of the methodology used	9
3.2. Results	15
4. Main challenges and conclusions	19
5. References	21
Annex. Calculations methodology	23

Abstract

Public libraries receive a significant amount of public resources. It is therefore essential to have rigorous evidence about the value they generate, both for decision makers and citizens. This study applies the Return on Investment methodology to estimate the benefits that public investment in the Libraries Network of the province of Barcelona provided to users from 2007 to 2011. The results offered suggest that the returns from this Network are comparatively high, given that every euro invested generates a benefit equivalent to 2.25 euros for users. This study is unprecedented in the province of Barcelona, but its contribution is also novel in the way it approaches the operationalization of the benefits of public libraries. Beyond the specific results of the analysis, it provides a replicable methodological framework that could well be applied to other studies assessing the value of public libraries in any other context.

Keywords: Libraries; Return on Investment; Public Value; Public Policy

1. Approach and aim of the study

Nowadays the need to have better instruments for accountability on social, economic and environmental value derived from public performances becomes more pressing. The language may change —impact, return, benefits, value— but questions related to which differences there are and how much of these differences have been created by the public sector remain the same (The SROI Network 2012).

In a context of budget restrictions, public investments in culture are questioned more than ever, and this is why it is important to assess the value of public libraries in society. Therefore, accountability and the widening of knowledge in this field imply knowing more than what these equipments do: it involves knowing which are the benefits derived from them (Holt & Elliott, 2003).

From the public management perspective the debate is very important. On the one hand because there is a trend to reduce expenses; on the other hand there is a debate about the dimension and polyvalence of public equipments, as well as of the potentialities of services that are managed via a network. Nowadays debates regarding dimensions of the equipments and their staff, opening hours, collection renovation or adaptation of services to ICT are currently valid. However, these considerations take place in a context that brings limited scientific evidence on the economic benefits of this local public service.

Therefore, the main aim of this study is *to estimate the benefits that public investment in the Libraries Network of the province of Barcelona (from now on XBM) provided to users from 2007 to 2011.*

Considering how complex this phenomenon is, and the enormous variety of possible alternatives to analyse it, it was finally decided to calculate the Return on Investment. Specifically, this study estimates the benefits (expressed in economic terms) that users obtain when consuming the main services that the XBM libraries offer (a total of 208 library equipments in 2011). Using this estimate it is intended to use and share useful information in order to provide a value that can describe the impact of public libraries, making tangible, if possible the part of public benefit generated by the investment in this kind of equipments.

2. Literature review

Although the value derived from public action goes further than what one can express in economic terms, nowadays this is the main value that is measured and for which accountability is based on. There is not an only way to measure the economic value that things have. However, there are useful and widely accepted ways to do so. (The SROI Network, 2012).

Starting from this framework, public libraries *receive a significant amount of public resources*, and as a consequence it is important to have evidence that highlight this profitability. That is, to what extent the money invested is producing satisfactory benefits both for the people and for the communities where they are located. In fact, to provide this information in a context of financial crisis is essential because it shows the value that public libraries have both for citizens and decision-makers.

It is worth mentioning that economic studies about libraries have been carried out since the beginning of investigation in this field, but it wasn't until the past few years that a specialisation based on knowing which economic value these public equipments generate has emerged. Fundamentally, starting from methods that give the whole of the library programmes and services a monetary value, we can show the efficiency in the use of public resources when creating value using an economically suitable terminology (Imholz & JW Arns, 2008).

Especially because of its recent nature, scientific production coming from this field of work is varied regarding the purpose, methodology used and extent. This fact makes the possibility of replicating and comparing the final results obtained in the various studies more difficult.

In any case, these economic methods give as a result, in their majority, data expressed either in terms of *Return on Investment* or the *cost-benefit*. Explained in a synthesised way, this method of calculation allows contrasting up to what extent the benefits that are derived from any intervention or public programme exceed the costs. Applying it to public libraries, it allows knowing how high is the *return* obtained for each euro that is invested.

2.1. Direct and indirect benefits

Although the *Return on Investment* is the ratio that results from contrasting costs and benefits, we have to bear in mind that not all benefits that are associated to public

libraries are the same. In accordance with specialised literature, benefits are usually classified as direct or indirect.

Direct benefits represent the economic value that users receive when they access the different library services. On the contrary, indirect benefits represent the economic value that derives from using these services, that is, of the consequences that come from receiving the service. Likewise, other indirect benefits are related to the whole of positive externalities that libraries generate in the communities where they are located (Levin et al., 2006), like the capacity to generate economic activity (McClure, 2000; Holt et al., 1996).

By way of illustration, direct benefit of a book to find a job will come from the fact that users can take it home, while indirect benefit will correspond to the benefit that users get thanks to having read it. This can be considered both from the perspective that then they are more prepared to find a job and possibly even because they will in fact find a job. Likewise, other indirect benefits emerge when the distribution of the loan material is carried out by local enterprises, contributing to revitalise economic activity.

Starting from the previous example, the difficulty of analysing the benefits in economic terms is obvious, especially the indirect, because it tries to make tangible aspects that are intangible, which are subject to many factors. This way, results could vary significantly depending on which are the benefits considered and on the specific method chosen for the calculation.¹

2.2. Methods to estimate benefits

Although the thread is the calculation of the *Return on Investment*, the way of monetising benefits varies depending on the type of benefit. Studies carried out up until now use a wide range of methodologies. According to Imholz and Arns (2008), we can talk about the contingent valuation method, the consumer surplus or the private market analogy methods and the measure of secondary economic impacts.

Contingent valuation is a method based on a survey that asks which is the monetary value that consumers give to public goods (Mitchell & Carson, 2005), on the basis of their willingness to pay. Applied to the public libraries' field, it consists in knowing how much users are willing to pay for the different services that these equipments offer, as well as for their improvement (Punga et al. 2004). Aabø has developed one of the most important studies on this field (Aabø, 2005).

¹ See "Table 8: Comparative results framework" of this study.

Among this typology, Imholz and Arns (2008) also include the revealed preference method which is based on estimating indirect benefit of public goods through the value of time or cost of the journey, among other things, attributed by those polled. However, it must be said that other authors consider that the revealed preference method is different to the contingent valuation method (Parera, 2009).

Although it is a quite widespread method, contingent valuation presents two important problems. On the one hand, since it is based on the users' criteria it is necessary to carry out surveys, which are expensive and timewise. On the other hand, the value that is attributed to the various goods and services is based on a subjective set of values, and does not take into account the income of those polled, or the compensations that people can obtain through other goods and/or services (Parera, 2009).

Additionally, Imholz and Arns (2008) also include the consumer surplus or the private market analogy, which relates those services that libraries offer to substitutes of the private market (Indiana Business Research Center, 2007). Although the services that a public library provides are normally free, the private market provides substitutive goods for the majority of these services. For example, loan users can buy a novel in the private market instead of ordering it at a library. In this case, the user's possibility to buy most of the loaning services that libraries offer becomes a good approach on the economic value that they have (Holt & Elliott, 2003).

In spite of the correspondence with the private sector, the main challenge related to this method lies in translating objectively the market price to the real value of services that public libraries provide: for example, it is not the same to buy a book or borrowing it for some days, so that then it can be borrowed by others. In order to correct this imbalance, as a general trend literature usually applies a discount factor to the market price.

Finally, the secondary economic impact measure monetises indirect benefit derived from the ability that the library has to generate positive impact on the economy of the community in which it is located. This is, the capacity in creating jobs, capacity to improve incomes because of the increase of expenses in the area or through a stronger tax collection, among others.

However, it has to be taken into account that some studies try to combine several methodologies to calculate benefits depending on the library services analysed (Barron et al., 2005; Fraser et al., 2002; Amat de la Flor et al., 2006).

2.3. Social Return on Investment²

In the last few years, literature on Public Administration and the third sector has witnessed the emergence of a field of analysis known as *social Return on Investment*, closely related to the precepts presented until now.

Based on the traditional logic of the Return on Investment, the social Return on Investment is a comprehensive framework of analysis that allows measuring the value associated to the social, environmental and economic impacts of the interventions and/or public services, and that uses monetary values to represent them.

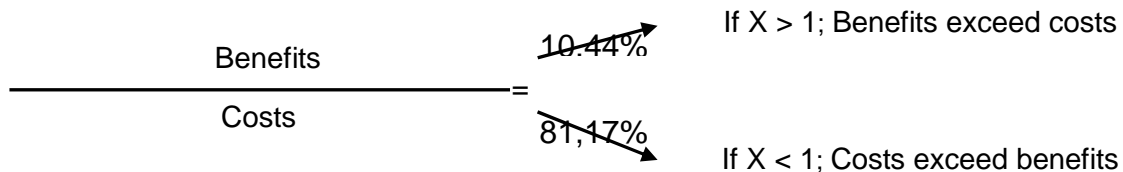
It is a method that is highly participatory, that is looking for the engagement of all the actors involved in the object of study, and although it offers as a result a ratio that contrasts benefits and costs, these are very different and are related to impacts that derive from the public sector analysed and not of the activities that are carried out.

3. Development of the study

3.1. Description of the methodology used³

As was set out in the previous section, choosing the calculation of the *Return on Investment* is very useful to be able to contrast to what extent the benefit derived from any intervention or public programme exceeds the costs. Expressed in a graph it would be:

Graph 1. Return on Investment



Source: Personal compilation

Applied to the XBM, we want to contrast if the benefits derived from the main library services compensate the costs associated to their operation and maintenance during the period 2007-2011. The services that were included in the analysis were:

² For more information about the social Return on Investment methodology refer to: The SROI network (2012). *A guide to Social Return on Investment*.

³ To view in detail the calculations methodology that has been used, refer to this study's annex.

1. Loan material:
 - Book lending
 - Audio lending
 - Video lending
 - Magazine lending
2. Librarians' advice
3. Computer use
4. Wi-Fi access
5. Programmes and activities
6. Space rental
7. Use of the material within the library.

Although the selected library services are the most representative of the kind of activity that takes place in these public equipments, it must be noted that because of a lack of information this study does not include the whole of the library services. Specifically, the following have been left out of the analysis: interlibrary loan, the collective catalogue of the XBM, and the virtual usage of the library, among others. To a certain extent, it was preferred to limit the breadth of the analysis in order to maintain the methodological rigour.

In order to contrast the benefits and costs that are derived from the services selected in the study, it is necessary that both concepts are expressed in the same measure unit. While costs are easily identified and are expressed in monetary units (€), benefits, at first, are not defined in these terms. For instance, we do not know the monetary value associated to the fact that a person benefits from taking a book home as a loan, or the monetary value associated to receiving specialised advice from a professional librarian.

In order to express benefits in monetary units, a series of calculations have been developed, in accordance with four phases:

1. To establish the monetary value per unit (M) for each service.
2. To know the Consumption (C) of each service.
3. To calculate the Economic value (V) of each service.
4. To calculate the Benefit (B)

Phase 1. To establish the monetary value per unit (*M*) for each service

Synthetically explained, in order to be able to establish the monetary unit that, in terms of benefits, is associated to the fact that a user consumes every library service, the method of the *private market analogy* was used —explained in the *Review of the literature* section—. To sum up, in this case it consists of relating the services provided by public libraries with substitutive services in the private market that have a monetary value.

That is, the aim is to express in “money” (monetary units) what the benefit that a person obtains is when using a certain library service.

Therefore, the monetary value per unit of each service has been calculated in a singular way, starting from the market price that similar services have in the private market: the purchase of books, audio, video and new and second-hand magazines; the dedicated salary for specialised advice; the computer renting; the Wi-Fi connection monthly cost; space rental according to public prices; or the cost for holding activities in civic centres.

It must be highlighted that the suggestion of methodology presented here intends to take into account the inherent diversity of the various library services analysed. For example, while the international studies that have been read generally confer one sole monetary value for each type of loan material, the method presented in this report reflects the differences found in each type of loan, bearing in mind that a comic book for adults does not have the same value as a specialised book. The basic premise for the calculation takes these questions into consideration, as can be seen in the following tables.

Starting from these premises, in Table 1 the various monetary values (*M*) conferred to each library service are shown.

Table 1. Monetary value per unit

TYPE OF SERVICE		MONETARY VALUE				
Loan material	Subtype	2007	2008	2009	2010	2011
Books	Adults' nonfiction	10,97 €	10,97 €	10,97 €	10,97 €	10,97 €
	Adults' fiction	12,18 €	12,18 €	12,18 €	12,18 €	12,18 €
	Adults' comic book	5,88 €	5,88 €	5,88 €	5,88 €	5,88 €
	Children's fiction	8,71 €	8,71 €	8,71 €	8,71 €	8,71 €
	Children's comic books	4,64 €	4,64 €	4,64 €	4,64 €	4,64 €
	Children's knowledge	8,56 €	8,56 €	8,56 €	8,56 €	8,56 €
Audio	Music CD for adults	12,01 €	12,01 €	12,01 €	12,01 €	12,01 €
	Music CD for children	10,80 €	10,80 €	10,80 €	10,80 €	10,80 €
	Others (multimedia, audiobooks and audioguides)	13,01 €	13,01 €	13,01 €	13,01 €	13,01 €
Video	Adults' fiction	5,27 €	5,27 €	5,27 €	5,27 €	5,27 €
	Adult's nonfiction	13,41 €	13,41 €	13,41 €	13,41 €	13,41 €
	Children's	8,78 €	8,78 €	8,78 €	8,78 €	8,78 €
Magazines	Magazines in general	2,90 €	2,90 €	2,90 €	2,90 €	2,90 €
Librarians advice	Service to the user (1 manager)	13.496,05 €	13.117,06 €	13.350,79 €	13.008,51 €	12.789,20 €
	Service to the user (1 librarian)	24.799,60 €	24.103,19 €	24.532,68 €	23.903,73 €	23.500,74 €
	Service to the user (1 auxiliary worker)	16.500,65 €	16.875,92 €	17.110,33 €	16.856,91 €	16.804,42 €
Computer use	Computer renting + internet (30 minutes)	3,02 €	3,02 €	3,02 €	3,02 €	3,02 €
Wi-Fi access	Average price per connection	1,55 €	1,55 €	1,55 €	1,55 €	1,55 €
Programmes and activities for children and for adults	Concerts (1h)	6,50 €	6,50 €	6,50 €	6,50 €	6,50 €
	Conferences (1h)	10,00 €	10,00 €	10,00 €	10,00 €	10,00 €
	Other courses and workshops (1.5h)	6,75 €	6,75 €	6,75 €	6,75 €	6,75 €
	Reading club (1h)	9,19 €	9,19 €	9,19 €	9,19 €	9,19 €
	ICT courses (2h) +	N/A	N/A	N/A	N/A	6,99 €
Space rental	Small-sized room (individuals)*	24,83 €	24,83 €	24,83 €	24,83 €	24,83 €
	Medium-sized room (individuals)*	38,28 €	38,28 €	38,28 €	38,28 €	38,28 €
	Large-sized room (individuals)*	51,72 €	51,72 €	51,72 €	51,72 €	51,72 €
	Auditorium (individuals)*	157,24 €	157,24 €	157,24 €	157,24 €	157,24 €
	Small-sized room (entities)*	9,91 €	9,91 €	9,91 €	9,91 €	9,91 €
	Medium-sized room (entities)*	12,07 €	12,07 €	12,07 €	12,07 €	12,07 €
	Large-sized room (entities)*	14,14 €	14,14 €	14,14 €	14,14 €	14,14 €
Use of material within the library	Auditorium (entities)*	47,17 €	47,17 €	47,17 €	47,17 €	47,17 €
	Material inside the library (books, audio, video, magazines and newspapers)	6,67 €	6,67 €	6,67 €	6,67 €	6,67 €

* According to "Anunci sobre preus públics del Consorci Bibliotecari de Barcelona", ("Announcement of public prices of the Consorci Bibliotecari de Barcelona") december 2011.

+) Until the year 2011 the ICT courses were included in "other courses and workshops". Since 2011 they are calculated separately, because nowadays they are a specific performance line that has experienced a very important increase.

Source: personal compilation

Phase 2. To know the Consumption (C) of each service.

According to the data provided by the "Unitat d'Estadístiques i Qualitat of the Gerència de Serveis de Biblioteques of the Barcelona province", it has been possible to know the consumption (C) of each of the selected library service. Specifically, this involves knowing how many books, audio, videos and magazines were loaned; how much advice was given, how many hours the computer was used; how many Wi-Fi connections were used, how many people attended the activities; how many areas were lent, and how many uses of material took place within the library.

In Table 2 the information of consumption detailed for each service is shown.

Table 2. Consumption of each service

TYPE OF SERVICE		CONSUMPTION				
Loan material	Subtype	2007	2008	2009	2010	2011
Books	no. of loans adult's nonfiction	1.565.823	1.709.542	1.828.294	2.036.720	2.003.103
	no. of loans adult's fiction	1.215.692	1.385.614	1.507.020	1.869.690	1.750.182
	no. of loans adult's comic books	139.736	152.551	177.368	200.375	224.599
	no. of loans children's fiction	876.122	1.014.560	1.055.079	1.106.622	1.276.948
	no. of loans children's comic books	190.998	220.824	277.094	302.075	338.461
	no. of loans children's knowledge	271.079	298.927	322.640	335.268	403.044
	TOTAL	4.259.448	4.782.017	5.167.495	5.850.750	5.931.754
Audio	no. of loans music CD for adults	1.224.091	1.139.123	1.063.336	942.710	944.624
	no. of loans music CD for children	100.940	105.032	99.194	101.907	98.299
	no. of loans others (multimedia, audiobooks and audioguides)	310.824	381.905	416.523	419.702	686.670
	TOTAL	1.635.856	1.626.061	1.579.053	1.464.319	1.729.593
Video	no. of loans adult's fiction	1.607.898	1.861.415	1.846.883	1.694.206	1.645.994
	no. of loans adult's nonfiction	257.661	275.860	284.197	276.090	243.822
	no. of loans children	742.104	857.231	873.092	804.258	625.531
	TOTAL	2.607.663	2.994.506	3.004.172	2.774.553	2.515.347
Magazines	TOTAL	588.491	608.315	626.534	592.844	588.872
Librarians advice	Manager (<i>Full time equivalent</i>)	167,56	170,98	183,32	193,37	206,16
	Librarian (<i>Full time equivalent</i>)	140,43	143,30	153,64	162,07	172,79
	Auxiliary worker (<i>Full time equivalent</i>)	547,13	563,28	618,51	653,80	708,20
	TOTAL	855,12	877,56	955,47	1.009,24	1.087,15
Computer use	30 minutes connections	864.497	901.637	991.134	1.122.075	1.065.806
Wi-Fi access	Wi-Fi connections	291.260	498.133	752.820	914.082	1.152.783
Programmes and activities for children and for adults	no. of people attending concerts	19.405	18.780	17.792	15.971	17.844
	no. of people attending conferences	49.485	51.228	53.876	51.597	55.251
	no. of people attending other courses and workshops	307.032	357.444	373.417	437.905	341.260
	no. of people attending reading club sessions	33.366	41.238	48.319	59.665	65.925
	no. of people attending ICT courses +	included in other courses and	included in other courses and	included in other courses and	included in other courses and	35.207
	TOTAL	409.287	468.690	493.404	565.138	515.487
Space rental	Hours of use small-sized room (individuals)	211	271	363	410	607
	Hours of use medium-sized room (individuals)	60	77	104	117	173
	Hours of use large-sized room (individuals)	24	31	41	47	69
	Hours of use auditorium (individuals)	6	8	10	12	17
	Hours of use small-sized room (entities)	1.896	2.437	3.265	3.692	5.460
	Hours of use medium-sized room (entities)	542	696	933	1.055	1.560
	Hours of use large-sized room (entities)	217	279	373	422	624
	Hours of use auditorium (entities)	54	70	93	105	156
	TOTAL	3.009	3.869	5.183	5.860	8.667
Use of material within the library	no. of annual uses (daily visit, habitual consumption)	622.612	685.579	710.668	731.570	737.261
	no. of annual uses (daily visit, consumption sometimes)	103.769	114.263	118.445	121.928	122.877
	no. of annual uses (some days a week visit, habitual consumption)	2.334.971	2.571.112	2.665.204	2.743.592	2.764.934
	no. of annual uses (some days a week visit, consumption sometimes)	428.075	471.367	488.617	502.988	506.901
	TOTAL	3.489.427	3.842.322	3.982.934	4.100.079	4.131.973

+)Until the year 2011 the ICT courses were included in "other courses and workshops". Since 2011 they are calculated separately, because nowadays they are a specific performance line that has experienced a very important increase.

Source: personal compilation

Phase 3. To calculate the Economic value (V) of each service

The economic value of each service (V) is obtained by multiplying the monetary value (M) of each service by its consumption (C). The results of this calculation are shown in Table 3.

Table 3. Economic value of each service

TYPE OF SERVICE	FINANCIAL VALUE				
	2007	2008	2009	2010	2011
Loan material	83.638.315,53 €	91.539.939,16 €	94.988.405,05 €	99.505.772,77 €	101.246.092,73 €
Books	43.643.371 €	48.947.410 €	52.691.633 €	60.203.239 €	60.753.917 €
Audio	19.838.255 €	19.786.616 €	19.263.580 €	17.885.294 €	21.342.658 €
Video	18.448.841 €	21.040.533 €	21.214.940 €	19.696.757 €	17.440.563 €
Magazines	1.707.847 €	1.765.381 €	1.818.253 €	1.720.482 €	1.708.954 €
Librarians advice	14.772.016 €	15.202.565 €	16.799.575 €	17.410.536 €	18.598.156 €
Computer use	2.606.458 €	2.718.434 €	2.988.270 €	3.383.056 €	3.213.404 €
Wi-Fi access	451.932 €	772.926 €	1.168.110 €	1.418.332 €	1.788.711 €
Programmes and activities	2.999.962 €	3.425.935 €	3.618.861 €	4.123.765 €	3.823.626 €
Space rental	40.667 €	43.446 €	70.048 €	79.198 €	117.134 €
Use of material within the library	23.260.890 €	25.613.319 €	26.550.656 €	27.331.556 €	27.544.168 €

Source: personal compilation

Phase 4. To calculate the Benefit (B)

Starting from each library service's economic value, it was possible to calculate the total benefit generated by the XBM every year (Table 4), adding up the economic value (V) of each of the services.

Table 4. Benefits

	2007	2008	2009	2010	2011
BENEFIT	127.770.241 €	139.316.565 €	146.183.926 €	153.252.215 €	156.331.291 €

Source: personal compilation. Decimals are not included

Once the benefits have been expressed in monetary units, they can be contrasted with the associated costs.

To do so, it is necessary to have a list with all the costs that are associated with the different library services. The costs that were considered for the calculation of the *Return on Investment* were those directly related to guarantee the operation and maintenance of the selected library services, not including the building costs or the launching of the equipments⁴.

On the one hand, the purchase costs for the various loan materials were taken into account, and on the other hand, a set of costs derived from: salary of the library staff,

⁴ If the costs related to building the equipment were also included, the fact that the benefits associated to building cannot be taken into account (because there is no information available on them) would distort the result of the calculation because the costs would be oversized compared to the benefits.

computer maintenance, transportation, supplies, cleaning, fungible material, renting of appliances and maintenance investments. It is clear that all these costs are also related one way or another, to guaranteeing users' access to the analysed library services.

Specifically, broken down according to the different services analysed, the costs are:

Table 5. Costs

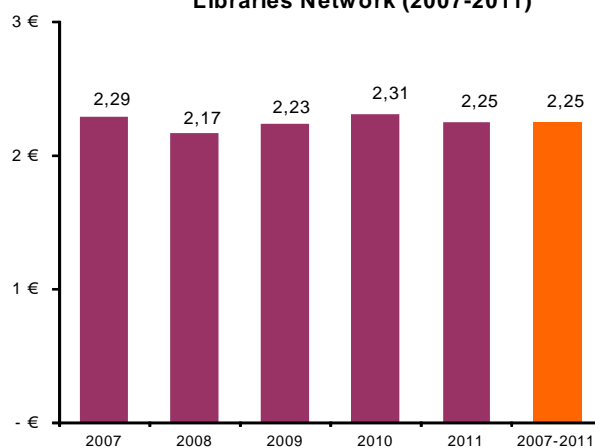
TYPE OF SERVICE	COSTS				
	2007	2008	2009	2010	2011
Loan material					
Books	6.434.215 €	8.654.196 €	7.261.737 €	6.289.234 €	4.954.82 €
Audio	865.649 €	858.223 €	928.616 €	829.177 €	673.935 €
Video	835.681 €	850.826 €	701.579 €	744.752 €	554.321 €
Magazines	1.557.158 €	1.619.354 €	1.901.080 €	1.977.363 €	1.900.81 €
Librarians advice	included in "other costs"	included in "other costs"	included in "other costs"	included in "other costs"	included in "other costs"
Computer use	included in "other costs"	included in "other costs"	included in "other costs"	included in "other costs"	included in "other costs"
Wi-Fi access	included in "other costs"	included in "other costs"	included in "other costs"	included in "other costs"	included in "other costs"
Programmes and activities	1.983.115 €	2.492.955 €	2.293.008 €	1.991.596 €	1.409.87 €
Space rental	included in "other costs"	included in "other costs"	included in "other costs"	included in "other costs"	included in "other costs"
Use of material within the library	included in "lending material costs"	included in "lending material costs"	included in "lending material costs"	included in "lending material costs"	included in "lending material costs"
Other costs	44.103.658 €	49.848.069 €	52.361.926 €	54.637.094 €	60113.133 €
TOTAL	55.779.476 €	64.323.623 €	65.447.946 €	66.469.216 €	69.606.468 €

Source: personal compilation. Decimals are not included.

3.2. Results

Taking into account the data previously shown, *for every year and according to the calculation method used, the benefits that are related to library services have far exceeded the costs aimed to guarantee their operation and maintenance.*

Graph 2. Return on investment of the Municipal Libraries Network (2007-2011)

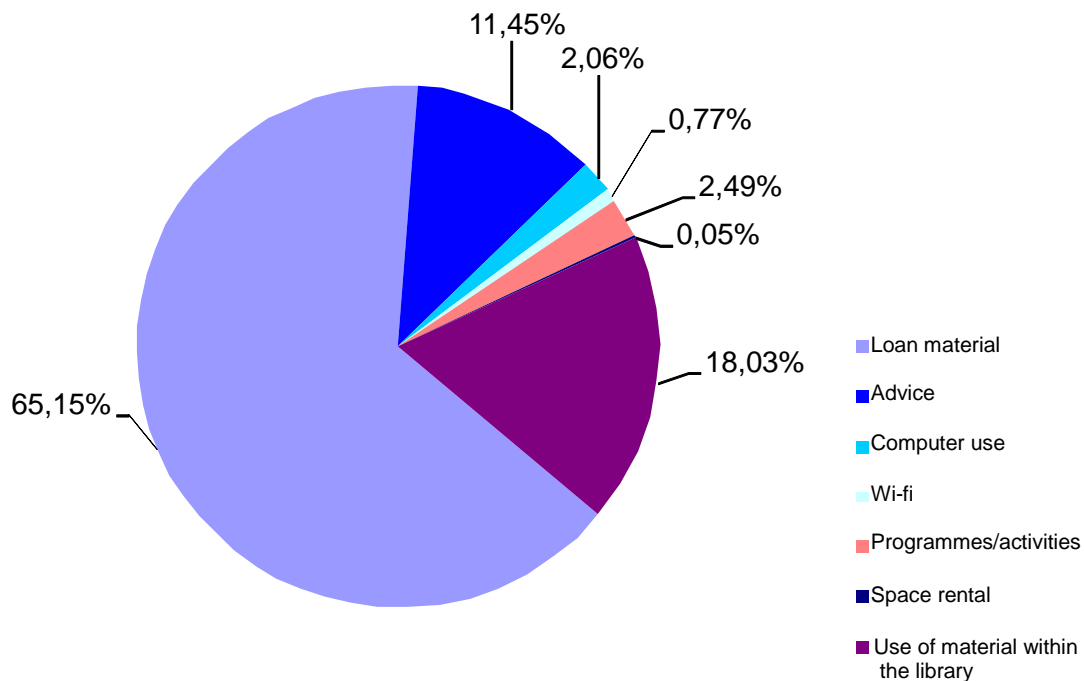


Source: personal compilation

Therefore, every euro that was invested in the XBM during the period 2007-2011 involves a benefit, on average, of 2.25€. The increasing trend that the Return on Investment undergoes throughout the years must be also emphasised. This fact is explained mainly because of the increase of the level of usage of different library services.

When analysing economic benefits in a separate way and independently from the costs, it is noticeable that the services with a larger benefit are loan material (65.15% of the total), followed by use of material within the library (18.03%) and advice (11.45%). On the contrary, space rental for carrying out activities is the service that contributes less on generating benefit (0.05%).

Graph 3. Distribution of the profits depending on the type of service (2007-2011)



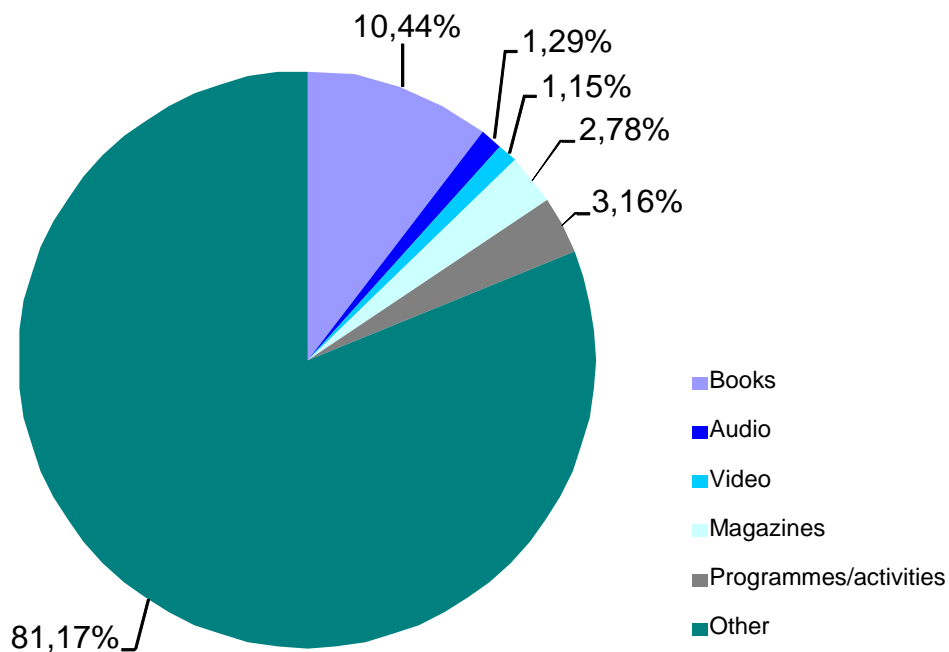
Source: personal compilation

The fact that the loan material —together with the use of material within the library and advice— are the library services that represent most of the benefit happens because they are also the ones that concentrate the largest usage level. Throughout the period 2007-2011 almost 51 million resources were loaned, half of which relates to books, and more than 23 million resources were used (books, videos, audio, and magazines/newspapers). Likewise, library users were given advice more than 45

million times. Therefore, setting aside intangible multiple benefits that are related to public libraries and that have an important value, nowadays the traditional library services still are the ones that generate most of the benefit expressed in economic terms.

On the other hand, if costs are analysed as a whole for the period 2007-2011, it is remarkable that those that have a largest percentage are the “other costs”. However, this piece of information can be understood bearing in mind that under this concept all building maintenance, computer (Wi-Fi and computers) expenses or library staff salary are included, making it very difficult to separate what corresponds to which service.

Graph 4. Distribution of the costs depending on the type of service (2007-2011)



Source: personal compilation

Below is a table that allows comparing the results of this study to those more distinguished studies that have been carried out internationally about the *Return on Investment*.

Table 6. Results comparative chart

STUDY	METHOD	COUNTRY	EXTENT	RETURN ON INVESTMENT⁵
<i>Return on investment of XBM of Barcelona province (2007-2011)</i>	<i>Private market analogy</i>	<i>SPAIN</i>	<i>Regional</i>	<i>1: 2,25</i>
The economic impact of Public Libraries on South Carolina (Barron et al., 2005)	Private market analogy	USA	Regional	1: 2,86
Value for money: Southwestern Ohio's from Investment in Public Libraries (Levin et al., 2006)	Private market analogy	USA	Regional	1: 2,56
The economic impact of Libraries in Indiana (Indiana Business Research Center, 2007)	Private market analogy	USA	Regional	1: 2,38
Taxpayer Return on Investment in Florida Public Libraries: Summary Report (Griffiths, 2004)	Contingent valuation	USA	Regional	1: 5,2
Libraries and economic value: A review of recent studies (Missingham 2005) related to the case of British Library Study	Contingent valuation	United Kingdom	Local	1: 0,71
Libraries and economic value: A review of recent studies (Missingham 2005) related to the case of St. Louis Public Library	Contingent valuation	USA	Local	1: 2,5
Community Impact and Benefits: Carnegie Library of Pittsburgh (Carnegie Mellon University Center for Economic Development, 2006)	Contingent valuation	USA	Local	1: 0,94
Public libraries and Valuation: A Norwegian study applying a non-market approach (Aabø, 2007)	Contingent valuation	Norway	State	1: 4
The Library Dividend. A guide to socio-economic value of Queensland's public libraries (State Library of Queensland, 2012)	Contingent valuation	Australia	Regional	1: 2,3

Source: Personal compilation based on the studies' analysis

However, it must be said that the ratios obtained would be significantly higher if the calculations incorporated indirect benefits (beyond the benefits that users obtain). And so, if calculating an average of ratios that were obtained on the studies that examine direct and indirect benefits, the Return on Investment is, on average, two points above

⁵ The results on this table only include the part on the ratio that refers to direct benefit. Therefore, the studies in bold and not italics are the ones that at the beginning influenced on the calculation of direct and indirect benefits, but that in order to make the comparison easier, in this piece of work the part that relates to direct benefits is shown. Therefore, the original ratio for the bold and not italics studies is quite superior.

those which only consider direct benefit. Therefore, the ratio of this study if estimating the indirect benefit would move from, 1: 2.25, reaching a 1: 4.25 ratio.,

4. Main challenges and conclusions

The main conclusion that can be drawn is that the *Return on Investment* of the main XBM services during the period 2007-2011 is highly positive. According to the results, *for every euro that the Public Administration invested in the main services of the XBM 2.25€ of direct benefit are generated.*

It must be said that obtaining this information was an unprecedented exercise for the XBM and complementary to other information necessary for a comprehensive analysis about the public value of local libraries. Using this information has shown the profitability (benefits vs. costs) that users obtain when consuming various services.

Bearing in mind that the information resources available on the XBM library services were reliable and of good quality, the analysis of the *Return on Investment* that was chosen presents multiple advantages. In the first place, the fact of having calculated benefit based on the *private market analogy* was an attainable exercise regarding the consumption of economic resources, and at the same time it allowed minimising subjectivity and arbitrariness when handling the information. In the second place, the method developed tries to correct the methodological malfunctions that have characterised previous studies, through a suggestion of methodology which is replicable and has a delimited temporal horizon.

However, the calculations of the *Return on Investment* that were carried out present some limitations that are worth mentioning. The fact of having estimated the benefits according to the *private market analogy* method has allowed examining only the library services that have some kind of correspondence with this method. Therefore some services were left out of the analysis, such as the interlibrary loan, the XBM collective catalogue and the virtual usage of the library. This fact allows stating categorically that the results obtained would have been greater if the analysis included all of the services.

Taking this information into account, it seems indisputable that the traditional purpose that has characterised public libraries, the purpose of loan material, is the one that nowadays generates most benefit for the users. This is something to reflect upon. The transformation that public libraries are nowadays undergoing, with new challenges and

needs, has to come with a solid and coordinated policy to promote and adapt their use to this new context.

In any case, the *Return on Investment* is a very useful exercise to obtain rigorous evidence that values the benefit derived from public libraries, and more specifically, from the libraries to the users.

For the future, it would be advisable to calculate the *Return on Investment* in a separate way in accordance with the population size of the territories where the XBM libraries are located. Likewise, it would be interesting to broaden the extent of these calculations, trying to seize the indirect benefits that these equipments entail. Therefore, a wider and integral point of view could be provided, about the unquestionable positive impact that public libraries generate in society.

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Annex. Calculations methodology

The services in the public library that are considered in the study are:

- Loaning material
- Librarians advice
- Computer use
- Wi-Fi access
- Programmes and activities for children and for adults
- Space rental
- Use of material within the library

To express the benefits of the library services in monetary units four fundamental steps have been developed:

1. To establish the monetary value per unit (M) for each service.
2. To know the Consumption (C) of each service.
3. To calculate the Economic value (V) of each service.
4. To calculate the Benefit (B)

However, to establish the costs no specific calculation methodology was needed, because it is accessible information and already identified in these terms (€).

Below are shown, in a detailed way, the calculations that have been developed to calculate benefits in accordance with the phases approached previously.

Phase 1. To establish the monetary value per unit (M) for each service

In order to establish the monetary value associated, in terms of benefit, to a user's consumption of each of the selected library services, the method *consumer surplus* has been used. Applied to this case, the method involves connecting the services that public libraries provide with substitutive services in the private market, which have monetary value.

That is, the aim is to express in "money" (monetary units) what is the benefit obtained by a person when using one of the library services analysed: taking home loan material; getting advice; using the computer; using Wi-Fi access; attending an activity; having an area at their disposal or using material within the library. Finding this value is equivalent to attributing a monetary value (M) to the unit consumption of each service.

To calculate the monetary value of each library service a personal methodology has been developed:

1.1 Loan material

Broadly speaking, assigning a monetary value per unit to each loan of material has been the result of applying a discount factor to the average sale price of this material in the private market.

The reason behind the necessity to apply a discount factor to the market price of different loan material is mainly because lending is not equivalent to buying. When users take home loan material from a local public library, they do it for a limited time period, and once this period is over, they must return it. This fact has the following theoretical implication: the economic benefit of any loan material is less than owning it, because when lending, the material can be used but not resold. This logic is the basis that allows valuing the economic benefit derived from the loan material: a quantity must be deducted from the purchase price in the private market so that the final price reflects the fact that the user cannot resell it.

The calculation of the *Return on Investment* that is presented in this study has developed a personal methodology to obtain a discount factor that corresponds to the real market, trying to minimise the risks of applying arbitrary discount factors.

Moreover, bearing in mind that the loan material is very diverse and, as a result, its price in the private market varies substantially, calculations were made based on a classification that considers this variety, in accordance with this typology and subtypology of material:

1. Book lending
 - Adults' nonfiction
 - Adults' fiction
 - Adults' comic books
 - Children's fiction
 - Children's comic books
 - Children's knowledge

2. Audio lending
 - Music CD for adults
 - Music CD for children

-Others (multimedia, audiobooks, audioguides)

3. Video lending

-Adults' nonfiction

-Adults' fiction

-Children's

4. Magazine lending

The aim of this first phase is to confer monetary value to a unit lending of each type of material. In the first place, the 10 most loaned titles were selected for each subtypology of loan material, that is, the 10 most loaned books of adults' nonfiction, adults' fiction, and so on for all the subtypologies of loan material.⁶

The sale price of each of these items in the private market as a new product and as a second-hand product was searched for, according to two different searches. As a result, four different prices can be seen for each title, two as a new product and two as a used product.

The fact that the private sale market counts with a new material offer and second-hand products (used) is a good approximation to determine the discount factor that is needed: the ratio between the price of the used book and the price of a new book.

Therefore, for each title the average price as a new product ($p.n.$) and the average price as a used product ($p.u.$) were calculated. Subsequently the ratio between the average price as a used product and the average price as a new product for each title was calculated, in order to know how much the former is worth in comparison with the latter. This ratio is called discount factor on the title ($f.d.$).

As an example, the discount factor of the most read book ($f.d._1$) should be calculated as:

$$f.d._1 = \frac{p.u._1}{p.n._1}$$

⁶ This piece of information has been provided by the Unitat d'Estadístiques i Qualitat de la Gerència de Serveis de Biblioteques of the Diputació de Barcelona, and it corresponds to the most loaned lending material in 2011.

Once the discount factor for each title is obtained, then the average discount factor for each subtypology of loan material was calculated. This ratio is called average discount factor of subtypology (*f.d.s.*).

Therefore, the calculation of this discount factor has been defined as:

$$f.d.s. = \frac{f.d._1 + f.d._2 + \mathbf{K} + f.d._{10}}{10}$$

Lastly, the discount factor for each typology was calculated, starting from the average of the discount factors according to the subtypology. This discount factor is called average discount factor of typology (*f.d.t.*).

For book lending it is expressed as:

$$f.d.t._{libros} = \frac{f.d.s._{no-fi_ad} + f.d.s._{fi_ad} + f.d.s._{còm_ad} + f.d.s._{imag_inf} + f.d.s._{còm_inf} + f.d.s._{coroc}}{6}$$

For audio,

$$f.d.t._{audio} = \frac{f.d.s._{adultos} + f.d.s._{niños} + f.d.s._{otras}}{3}$$

For video,

$$f.d.t._{video} = \frac{f.d.s._{no-fi_ad} + f.d.s._{fi_ad} + f.d.s._{inf}}{3}$$

And lastly, for the magazines lending, since there are no subtypologies, the discount factor of the typology is the same as the discount factor of the subtypology.

$$f.d.t._{revistas} = \frac{f.d._1 + f.d._2 + \mathbf{K} + f.d._{10}}{10}$$

Once the discount factor needed is obtained, the average price for first hand books for the first 10 titles of each subtypology was calculated.

For example, in the case of adults' nonfiction books, the average price for first-hand books should be calculated as:

$$p.n._{no-fi_ad} = \frac{p.n._1 + p.n._2 + \mathbf{K} + f.d._{10}}{10}$$

Lastly, to obtain the monetary value (M) of the loan service for each of the subtypologies, the average discount factor of the typology has been multiplied by the average price for first-hand products of each of the typologies. These results are, by themselves, the monetary value attributed to unit consumption of each subtypology. In the example of adults' nonfiction adults it is expressed as:

$$M_{no-fi_ad} = f.d.t._{libros} * p.n._{no-fi_ad}$$

1.2 Librarians' advice

The monetary value attributable to the advice would have been easier if it had been possible to identify a similar service in the private market. However, at the moment of writing the study there was not any reliable information available. For this reason the following calculations were applied.

Taking into account the annual salary ($s.a.$) earned by all the professionals that work in a local public library (library manager, librarian and auxiliary staff) and the percentage of working hours that each type of personal devotes to giving advice to users⁷ ($j.l.a.$) the calculations for the monetary value that the advice from each type of professional is worth ($M_{asesoramiento}$) comes from multiplying the annual salary of each professional by the percentage of their working hours that they dedicate to giving advice.⁸

For library managers this is expressed as:

$$M_{asesoramiento\ (director)} = s.a._{director} * j.l.a._{director}$$

For librarians,

$$M_{asesoramiento\ (bibliotecario)} = s.a._{bibliotecario} * j.l.a._{bibliotecario}$$

For auxiliary staff,

$$M_{asesoramiento\ (auxiliar)} = s.a._{auxiliar} * j.l.a._{auxiliar}$$

⁷ This dedication percentage was taken from the study COMPARTIA (2012)

⁸ Tasks related to advice are: selective spreading of information, recommendations, documental searching, bibliography advice, referential service, elaboration of reading guides and bibliography novelties, user formation and advice for schools and entities.

Therefore, it has been considered that the percentage of each type of salary of the professionals devoted to advice is related to the annual monetary value of this service conferred to each professional.

1.3 Computer use

Considering that the use (consumption) of a computer is measured in time, the monetary value estimated should be expressed according to this measure unit. Therefore, the monetary value for a computer use ($M_{ordenador}$) is equivalent to dividing by the average price entailed by renting a computer for one day⁹ ($tarifa_día_ordenador$) by the 8 hours of use that were estimated as a one day renting performance. In spite of this, bearing in mind that each consumption is expressed in slots of 30 minutes, the resulting value was divided by two.

$$M_{ordenador} = \left(\frac{tarifa_día_ordenador}{8} \right) / 2$$

The reason why computer renting was selected as a reference, instead of it being the fees of a cybercafé, for example, is mainly because of the fact that its use is thought of in the framework of the Multimedia Areas in the library. It is a closed space thought to make individualised or collective learning easier, with the help of technology. This is intended to help language learning, office automation and/or to use the computers to work on projects, curriculums, learning computer programmes, etc. There are computers with different programmes that people can use freely —booking the computer first—, both for Windows and Linux.

1.4 Wi-Fi access

The monetary value for each connection to a Wi-Fi service (M_{wifi}) is equivalent to the average price of a monthly charge of a household use Wi-Fi service¹⁰ ($tarifa_mensual_wifi$) divided by the number of estimated monthly connections that are used in a home ($conexions_llar$)¹¹. That is:

$$M_{wifi} = \frac{tarifa_mensual_wifi}{conexiones_hogar}$$

⁹ This piece of information was obtained by searching in various entities that offer computer renting, such as Abacoproectores, etc.

¹⁰ According to the prices established by ONO, Vodafone, Telefónica and Orange (home prices, 2011)

¹¹ According to the study data of IDESCAT (2011)

1.5 Programmes and activities for children and for adults

In the first place, four typologies of activities and programmes were set up:

- Concerts
- Conferences
- Other courses and workshops
- Reading club
- ICT courses

For each typology, a search was carried out to find the average price per hour (*p.m.h.*) for similar programmes and activities that the private market offered, in accordance with three different searches¹². This average price is the monetary value of every unit consumption of a programme or activity.

Therefore:

$$M_{aud\&conciertos} = p.m.h._{aud\&conciertos} ; M_{conf} = p.m.h._{conf} ; M_{otros} = p.m.h._{otros} \text{ and}$$
$$M_{club} = p.m.h._{club} ; M_{TIC} = p.m.h._{TIC}$$

1.6 Space rental

In the first place, four typologies of spaces were set up, according to their size:

- Small-sized room
- Medium-sized room
- Large-sized room
- Auditorium

For each room typology the price per hour for the space rental (*p.e.*) fixed in the “Announcement of public prices of the Consorci Bibliotecari de Barcelona (2011)” was taken into account.

This regulation fixes a different price per hour for individuals and for entities with no benefit in mind. As information was only at hand about the separate space use by room type, this distinction was maintained in the analysis.

Therefore, the price per hour in this regulation is the monetary value which is attributed to the unit consumption of a room.

¹² The searches were made according to the offer of activities of a similar nature in civic centres.

Then, if we take as an example the use of a small room for an individual (part), its monetary value should be:

$$M_{pequeña(part)} = p.e._{pequeña(part)}$$

1.7 Using material within the library

The monetary value conferred to the material that is used within the library (books, audio, video and magazines/newspapers) was calculated on the basis of the monetary value per unit for each typology of loan material (made up of the monetary value for each subtypology).

The reason why the loan material values were used is because in both cases they are the same resources, with the only difference that the former are loaned and the latter are consumed within the library. However, given that the material used in the library is basically books and magazines/newspapers, the monetary value was compared¹³: books and magazines/newspapers represent 80% of the total, and audio and video, 20%.

$$M_{uso_dentro_biblios} = (M_{libros}) * 0,4 + (M_{audio}) * 0,1 + (M_{video}) * 0,1 + (M_{revistas}) * 0,4$$

Phase 2. To know the Consumption (C) of each service.

Taking into account the data given by the Unitat d'Estadística i Qualitat de la Gerència de Serveis de Biblioteques, the consumption (C) was obtained for each of the selected library services.

2.1 Loan material

It is equivalent to the total number of loans of each typology and subtypology of loan material in a year ($C_{préstamo}$).

2.2 Advice

¹³ According to the data of "Study of library uses" (aggregated results of 29 municipalities) carried out by the Servei d'Avaluació i Qualitat de la Diputació de Barcelona, the majority of the polled use material, read books, magazines and newspapers.

As monetary value is related to the library staff's salary, the consumption unit needed is the number of professionals according to the typology ($C_{asesoramiento}$).

2.3 Computer use

It is equivalent to the number of uses of one computer during 30 minutes ($C_{ordenadores}$)

2.4 Wi-Fi access

It is equivalent to the total number of connections to the Internet (C_{wifi}), that is, how many times a user connects to the Internet.

2.5 Programmes and activities for children and for adults

As the information about the separate number of people attending programmes and activities for each typology (concerts, conferences, other courses and workshops, reading club and ICT courses) was only available for the year 2011, an estimate was used for the rest of the years.

Therefore, for the year 2011 the number of people attending programmes and activities of each typology was divided by the total annual hours aimed to organising each activity. This way the ratio of people attending per hour for each programme and activity was obtained ($as.h.2011$).

For the rest of the years, as we had the total hours aimed at each activity ($h.act.$) but not of the number of people attending, we multiplied the people attending in an hour of each typology (in 2011) by the total hours of each activity. As a result, the estimated number of people attending for the rest of the period (2007-2010) was obtained. Therefore, for example, the concerts consumption in the year 2008 ($C_{aud\&conciertos(2008)}$) were calculated as:

$$C_{aud\&conciertos(2008)} = h.act._{aud\&conciertos(2008)} * ass.h._{aud\&conciertos(2011)}$$

2.6 Space rental

We have the total number of space use ($h.e.$), although this one has been broken down depending if they were loaned to individuals (10%) or to entities (90%)¹⁴.

¹⁴ The use distribution according to individuals or entities has been provided by the Unitat d'Estadístiques i Qualitat de la Gerència de Serveis de Biblioteques of the Diputació de Barcelona.

From there, the calculation of hours of use for individuals and for entities was broken down depending on the frequency of use for each type: the small-sized room (70%), the medium-sized room (20%), the large-sized room (8%) and the auditorium (2%)¹⁵. This allows calculating the consumption, in hours for each type of room, both for individuals and for entities. For example, the annual consumption of small-sized rooms for individuals ($C_{pequeña(particular)}$) is represented by this formula:

$$C_{pequeña(part)} = 0.10 * (0.70 * h.e.)$$

2.7 Using material within the library

In contrast to the loan material, the use of material within the library is not registered. For this reason, the calculations are based on a survey answered by users of the XBM public libraries¹⁶.

It must be added that the calculation starts from a very conservative approximation, in which the only polled people that are considered are the ones that declare that they go to the library throughout the year and that have one of the four following characteristics¹⁷:

- Those who go every day and normally use the material (A).
- Those who go every day and sometimes use the material (B).
- Those who go some days a week and normally use the material (C).
- Those who go some days a week and sometimes use the material (D).

As a result of this survey, each subgroup has got a percentage of affirmative answers. Based on the distribution of each subgroup, the results were extrapolated to the set of active users of libraries depending on the subgroup (N), given that the sample is a representative one and it allows doing so. With this distribution of active users that would be placed in these four subgroups, the annual consumption of material in the XBM libraries was calculated, assuming that:

¹⁵ The use distribution according to the room type was provided by the Unitat d'Estadístiques i Qualitat de la Gerència de Serveis de Biblioteques of the Diputació de Barcelona

¹⁶ "Study of library uses" (aggregated results of 29 municipalities) carried out by the Servei d'Avaluació i Qualitat de la Diputació de Barcelona.

¹⁷ Therefore, the users that only go to the library when they are on holiday or during exams were not included, and neither were the ones that use the material a few times a month, once or less, or in periods.

- There are 43 active weeks in a year¹⁸.
- Going to the library is equivalent to doing so 4 times a week¹⁹.
- Going to the library a few times a week is equivalent to doing it twice a week.
- Using material usually is equivalent to doing so 80% of the time.
- Using material sometimes is equivalent to doing so 20% of the time.

Starting from these assumptions, the consumption for each group for 2011 is expressed as:

$$C_A = N_A * 4 * 43 * 0.8, \quad C_B = N_B * 4 * 43 * 0.2, \quad C_C = N_C * 2 * 43 * 0.8, \\ C_D = N_D * 2 * 43 * 0.2$$

Phase 3. To calculate the Economic value (V) of each service

The economic value for each service (V) is obtained from multiplying the monetary value (M) of each service by its consumption (C). This way the benefit derived from the total consumption for each service can be known.

For example, the economic value of lending nonfiction books for adults has been calculated as:

$$V_{no-fi_ad} = M_{no-fi_ad} * C_{no-fi_ad}$$

Therefore, the economic value of each service is:

$$V_{préstamo} = V_{no-fi_ad} + V_{fi_ad} + V_{cóm_ad} + V_{im_inf} + V_{cóm_inf} + V_{econoc_inf}$$

$$V_{asesoramiento} = V_{asesoramiento(director)} + V_{asesoramiento(bibliotecario)} + V_{asesoramiento(auxiliar)}$$

$$\left. \begin{array}{l} V_{ordenadores} = V_{ordenadores} \\ V_{wifi} = V_{wifi} \end{array} \right\} \text{Adv} \quad \text{(there are no typologies)}$$

$$V_{p\&a} = V_{aud\&conciertos} + V_{conf} + V_{otro} + V_{club} + V_{TTC}$$

¹⁸ In 2011, the average of opening days in libraries was 261, which, expressed in weeks is equivalent to 43, bearing in mind that they open 6 days a week.

¹⁹ The following are the options suggested by the question about frequency of library use: every day, some times a week, some times a month, once or less a month, depending on the period, others. Therefore, from a conservative perspective it was considered that people who declare going to the library every day (based on 6 possible days) actually go only 4 days, because in many cases they do not take into consideration Saturday on the answer, nor those days where they miss going. Consequently, those who say going to the library some times a week do so half the days of those regular, and therefore, 2. The rest of categories are referred to a visit frequency of less than a day a week (not included in the analysis).

$$V_{\text{espacios}} = V_{\text{pequena(part)}} + V_{\text{pequena(ent)}} + V_{\text{mediana(part)}} + V_{\text{mediana(ent)}} + V_{\text{grande(part)}} + V_{\text{grande(ent)}} + V_{\text{audi(part)}} + V_{\text{audi(ent)}}$$
$$V_{\text{uso_dentro_biblios}} = V_A + V_B + V_C + V_D$$

Phase 4. To calculate the Benefit (B)

Lastly, once the economic value for each service has been calculated, it is necessary to know the total benefit derived from the selected library services.

To get the total benefit (*Bibliotecas*) the economic value of each of the library services must be added up. Therefore,

$$B_{\text{bibliotecas}} = V_{\text{préstamo}} + V_{\text{asesoramiento}} + V_{\text{ordenadores}} + V_{\text{wifi}} + V_{\text{p\&a}} + V_{\text{espacios}} + V_{\text{uso dentro biblios}}$$