

# Budgeting for a Main Library and Several Departmental Libraries

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## BUDGETING FOR A MAIN LIBRARY AND SEVERAL DEPARTMENTAL LIBRARIES.

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In this report I want to communicate a simple formula which we used successfully in our University to compute and to divide the library budget for subscriptions to periodicals and for acquisition of books. In 1975 we still got a budget of Fl. 875.000 for it. At the end of 1975 the University Board told me that it would be cut down to Fl. 845.000 in 1976. Apparently, the Board was not aware of the fact that prices had gone up in 1975 with about 14% on the average, that subscriptions to periodicals for 1976 could not be cancelled at that time any more and that, therefore, the number of books we would be able to buy in 1976 would be less than half the number of books we bought in 1975. Confronted with these facts, the (chosen) University Council superseded the Board's decision, endowed the library with another Fl. 75.000 (so that the 1976 budget was changed into Fl. 920.000) and stated that, whatever the cut-down of the university budget (by the Dutch Government) would be in the future, the library budget should be kept on a reasonable level, i.e., a level which would be agreed upon by the librarian and the Library Advisory Committee (L.A.C.) to be reasonable. (The L.A.C. consists of members representing the different departments of the University.)

Consequently the L.A.C. installed a working group presided by Dr. Boon, L.A.C. member on behalf of the department of Industrial Engineering, in order to make up a suitable budgetting model. First, we cancelled more than 10% of our subscriptions to periodicals and to loose leaflet books - which have to be treated in the same way as budgetting is concerned - and we agreed upon what we called standard packages of periodicals and loose leaflet books for each library department. Each department would get enough money every year to pay for its standard package, whatever the rise of the total price of that package would be. The department would be allowed to change titles within the package as far as this would not affect the total price. If, however, a department would subscribe to more periodicals or loose leaflet books than was provided for by its standard package, the department would have to pay these out of the budget it would get for buying books and, therefore, the price increases of these subscriptions would not be compensated fully and the department would be forced to buy less books.

Secondly, we stated that all library departments together should get a budget for books which would be enough to buy 7,000 books in 1977. This was considered to be a reasonable minimum; in the years 1972 - 1975 the library bought about 9,000 books yearly on an average. Parts of serials which are not periodicals, are treated as books in this respect, because their prices rise as much as those of other books. We made, however, an exception for bibliographies and other reference material. Therefore, we reserved a part of the acquisition budget for what we called central service. This part of the budget will be assessed separately every year and will provide for general reference material (including bibliographies), for newspapers and weekly papers, for buying our own university dissertations (for exchange purposes) and for supplying the University Board, the University Council, etc., with the literature needed for its functioning. (For 1977 we assessed Fl. 123.200 for central service.)

Thirdly, we constructed a formula which gives a clear picture of the three parts of the acquisition budget mentioned above. In order to understand this formula, one should know that our library consists of 9 departmental libraries and a central library; the latter consists of a section which - including the bibliographical department - provides for the central service, and of a section which takes care of the main reading-room. This room contains two collections, one for general education of the students (literature on fine arts, history, geography, etc.) and one which mainly consists of textbooks for

undergraduates. In the formula these two collections are treated as departmental libraries (indicated by d).

The formula runs as follows:  $B(n) = cs(n) + \sum_d sp(d,n) +$

$$x \cdot \sum_d nb(d) \cdot nu(d,n) \cdot ep(d,n) \cdot \frac{rp(d,n-3) + rp(d,n-2) + ep(d,n-1)}{rp(d,n-3) + rp(d,n-2) + rp(d,n-1)}$$

$B(n)$  is the total acquisition budget for the year  $n$ ,  $cs(n)$  is the budget for central service in the year  $n$ , and  $sp(d,n)$  is the budget needed for the standard package for departmental library  $d$  in the year  $n$ .

$x$  is a variable: if  $B(1977)$  is sufficient to buy 7,000 books in 1977 after the central service and all the standard packages in 1977 have been taken care of,  $x = 1$ ; if, however,  $B(1977)$  is only sufficient to buy 6,000 books in 1977 under the same conditions,  $x = 6/7$ . (Of course, we ask for a budget such that  $x \geq 1$ ; however, we may get a budget such that  $x < 1$ .)  $nb(d)$  is a constant number for each departmental library separately, viz., the number of books to be bought yearly for each "user" of that departmental library  $d$ .

$nu(d,n)$  is the number of "users" of departmental library  $d$  in the year  $n$ ; this number has been defined as the number of faculty members +  $\frac{1}{2}$  the number of fellows +  $\frac{1}{5}$  the number of graduate students of the department in question. Therefore,  $nb(d) \cdot nu(d,n)$  is the number of books to be bought for departmental library  $d$  in the year  $n$ , i.e., if  $x = 1$ ; if  $x = 6/7$ , only  $6/7$  times that number of books can be bought for departmental library  $d$  in the year  $n$ . For the two collections of the main reading-room the product  $nb(d) \cdot nu(d,n)$  has been fixed upon 550 and 800, respectively.

$ep(d,n)$  is the estimated average price of a book for departmental library  $d$  in the year  $n$ ; I will explain later how we estimate.  $rp(d,n-3)$  is the real average price of a book for departmental library  $d$  in the year  $n-3$ ; so far as the formula has to be filled in at the end of the year  $n-1$ ,  $rp(d,n-1)$  has to be taken as the real average price of a book for departmental library  $d$  in the year  $n-1$  till the moment in which the formula is filled in.

The fraction at the end of the formula is a correction factor, the meaning of which will get clear after I explain how we estimate the average prices of books. This is done as follows. We assume that the average prices of books for a certain departmental library rise roughly according to the formula

$$y = b \cdot e^{at} = b + b \cdot at + 1/2 \cdot b \cdot a^2 t^2 + 1/6 \cdot b \cdot a^3 t^3 + \dots$$

The real average prices for  $t = 0$ ,  $t = 1$  (one year later),  $t = 2$ , ...,  $t = p-1$  and  $t = p$  are known. By the method of least squares we determine  $a$  and  $b$  such that the curve given by  $y = b \cdot e^{at}$  fits best to those real average prices. Using the formula  $y = b \cdot e^{at}$  with these values of  $a$  and  $b$  we determine by extrapolation the value of the average price to be expected for  $t = p+1$ , i.e., the estimated average price for the next year.

The increase of the average price, however, is not only affected by the way in which prices of books in certain areas of science rise in general, but may for a certain departmental library be affected by shifts of interest, by incidental buying of a small number of very expensive books, etc. If this leads to a relatively high deviation of the real average price in the year  $n-1$  ( $t = p$ ) from the average price which had been expected by extrapolation based on the real average prices known for  $t = 0$ ,  $t = 1$ , ...,  $t = p-2$  and  $t = p-1$ , i.e., from the estimated average price for the year  $n-1$ , the curve mentioned will be effected in such a way that  $ep(d,n)$  will deviate also highly from the average price which would have been expected for the year  $n$  if things had been more normal in the year  $n-1$ . Therefore, we multiplied  $ep(d,n)$  with a correction factor such that  $ep(d,n)$  is corrected slightly downwards if  $rp(d,n-1) > ep(d,n-1)$  and slightly upwards if  $rp(d,n-1) < ep(d,n-1)$ . For instance, the real average prices for books in the library of our Electrical Engineering department were Fl. 43,7 in 1972, Fl. 47,5 in 1973, Fl. 45,7 in 1974 and Fl. 51,1 in 1975. Consequently, the average price  $ep(E,1976)$  to be

expected for this departmental library (E) in 1976 according to our extrapolation method was Fl. 52,3. However, the real average price in 1976 was Fl. 61,0. Therefore,  $ep(E,1977)$  was corrected downwards by a factor 0,95;

$$\text{for } \frac{45,7 + 51,1 + 52,3}{45,7 + 51,1 + 61,0} = 0,95.$$

Two questions remain to be answered. First, how do we estimate at the end of year  $n - 1$  what the price of a standard package will be in year  $n$ ? Well, we made the following observation. The price increase of a standard package for a departmental library in the year  $n$  is about the same as the price increase for the year  $n$  of those periodicals in that package which have been paid already beforehand in the year  $n - 1$ . On an average the number of those periodicals account for about 10% of the total number of periodicals in the package. By computing the average price increase of those 10% at the end of year  $n - 1$  we get, therefore, a fair estimate of the price increase of the total package in the year  $n$ .

Secondly, how did we fix  $nb(d)$  for each  $d$  separately? This is a crucial point. It is clear that  $nb(d)$  should be bigger for the library of a department which is mainly focused on social science than for the library of a department which is mainly interested in technology; also, that  $nb(d)$  should be bigger for the library of a department interested in areas of science which are widely dispersed, than for the library of a department focused on a more homogeneous area of science, and so on. However, these criteria were not clear-cut enough to decide on the best values for  $nb(d)$ . At least we came to an agreement in the following way. By voting about different plausible distributions of 7,000 books over the 11  $d$ 's (i.e., 9 departmental libraries and the two collections of the main reading-room) the departmental librarians and the L.A.C. members agreed upon what they thought would be the most plausible values for the product  $nb(d) \cdot nu(d,1977)$ . Thus implicitly  $nb(d)$  was fixed for each  $d$ . The product  $nb(d) \cdot nu(d,n)$  i.e., the number of books to be bought for departmental library  $d$  in the year  $n$ , will change in proportion to the change of  $nu(d,n)$ . Only, as said before, for the two collections of the main reading-room  $nb(d) \cdot nu(d,n)$  has been fixed upon 550 and 800.

We are aware of the fact that our formula, and the way our formula is used, can be rightly criticized from several points of view. It certainly has to be improved in the course of years. However, the mere fact that the formula exists and is used (and, by the way, that it does not bear the name of the librarian himself, but of Dr. Boon) has already had a tremendous impact. We made clear to the University Board, by using the formula, exactly what the acquisition budget for our library had to be in 1977 in order to keep the central service at the present level, to pay for the standard packages (which implied already a cut of at least 10% as compared to the years 1972 - 1975) and to pay for 7,000 books (which meant a cut of at least 20% as compared to those years); and we could show exactly how many less books we would be able to buy in 1977 if the Board would allot an acquisition budget smaller by such-and-such an amount. As a result, according to the vote of the University Council, we got for 1977 an acquisition budget (Fl. 1.000.000) which left us exactly enough money (Fl. 373.100) to buy 7,000 books for all  $d$ 's together, i.e.,  $x = 1$  for 1977. Moreover, we were able to divide this budget among the main library and the several departmental libraries without any further quarrel, and we could early in 1977 make a rough, but not too inaccurate estimate of the acquisition budget (about Fl. 1.105.000) we will need in 1978; the Board adopted this figure in its letter to the Dutch government in which it indicated what the budget of our university has to be in 1978.