

## Allocating the Book Budget: Measuring for Inflation

*A simple algebraic method of compensating for inflation while allocating the book budget by funds is presented. Also described are the results of attempts to generate library-resource unit cost figures based on internal measurement of buying patterns. As the necessary management information becomes more available through the spread of automated acquisitions systems, the method should prove useful in changing professional and faculty budgetary thinking from dollar amounts to library-resource units.*

ONE OF THE MOST enduring sports in the field of academic librarianship is the ongoing attempt to create a rational, scientific model for allocating the book budget. One such model, which was described in these pages in 1974, proposed that the book budget be allocated by assigning funding units (e.g., art, psychology) a proportion of library-resource units instead of line-item amounts of money.<sup>1</sup> A library-resource unit was defined as being one monograph, one serial subscription, or a comparable microform unit. The model further proposed that the internal monograph-serial balance within each funding unit be set according to an agreed upon optimum for the discipline.

The theoretical merits of this model were sharply debated in subsequent articles, and it is not the author's purpose to join in this debate.<sup>2</sup> It can, however, be reported that this model has been in use at the Portland State University library for the past two and one-half years on the monographic side of the book budget. Combined with internal measurement of monographic inflation rates, it has proved to be an effective tool for compensating for differing inflation rates among the various discipline funding units. And, when the original matrix form of the model is transposed into simple algebraic form, it is extremely easy to apply.

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This article describes the algebraic form of the proportional budgeting model and briefly outlines PSU's experience with determining inflation rates based on its own purchases.

### ALGEBRAIC PROPORTIONAL BUDGETING MODEL

The use of this model assumes that each funding unit within a book budget has been assigned a proportion of the total number of monographic library-resource units the budget will buy (e.g., English, 0.5; physics, 0.3; art, 0.2). It further assumes that a record of purchases by funding unit has been kept so that funding unit costs can be projected. The accuracy of the model depends on the accuracy of the inflation projections. The worth of the model depends on the appropriateness of the funding unit allocation proportions. Its purpose is to maintain the allocated proportions according to a set standard, hopefully optimal.

The algebraic proportional budgeting model as applied to monographs is quite uncomplicated. It is a simple algebraic equation solving for one unknown,  $X$ , the total number of monographic library-resource units the budget will buy. The equation is as follows:

$$T = X (M_1U_1 + M_2U_2 + \dots + M_nU_n)$$

where:  $T$  = the amount of money available for monographs.

$X$  = the number of monographs the

budget ( $T$ ) will buy.

$M$  = the proportion of monographs allocated to a given funding unit.

$U$  = the unit cost of a monograph within a given fund as determined by inflation in that discipline.

As an example, let us look at a sample library book budget over a two-year period. In "year one" our sample library has a monographic book budget of \$10,000 and three individual funding units. The funding units have the following characteristics:

- Fund #1: Proportion, 0.5 of monographs.  
Unit cost for "year one," \$10.
- Fund #2: Proportion, 0.3 of monographs.  
Unit cost for "year one," \$15.
- Fund #3: Proportion, 0.2 of monographs.  
Unit cost for "year one," \$30.

$X$ , the number of monographs the budget will buy, becomes the following in "year one":

$$\begin{aligned} \$10,000 &= X(0.5(\$10) + 0.3(\$15) + 0.2(\$30)) \\ X &= 645 \end{aligned}$$

The book budget by funding unit would be:

	Monographs	Dollars
Fund #1: 0.5 times		
645 times \$10:	323	\$ 3,230
Fund #2: 0.3 times		
645 times \$15:	194	2,910
Fund #3: 0.2 times		
645 times \$30:	<u>129</u>	<u>3,870</u>
totals	646	\$10,010

(inaccuracies are due to rounding)

Let us say that in "year two" no program changes have taken place, and we want to maintain the proportions we had in "year one." The book budget, however, has increased to \$15,000, and the new cost of monographs is predicted to be the following by fund:

- Fund #1: \$12 each.
- Fund #2: \$16 each.
- Fund #3: \$40 each.

The new budget then becomes:

$$\begin{aligned} \$15,000 &= X(0.5(\$12) + 0.3(\$16) + 0.2(\$40)) \\ X &= 798 \end{aligned}$$

	Monographs	Dollars
Fund #1: 0.5 times		
798 times \$12:	399	\$ 4,788
Fund #2: 0.3 times		
798 times \$16:	239	3,824
Fund #3: 0.2 times		
798 times \$40:	<u>157</u>	<u>6,280</u>
totals	795	\$14,892

(inaccuracies are due to rounding)

If unit cost estimates are at all accurate, keeping the proportions constant clearly is a simple matter.

#### INTERNAL MEASUREMENT OF MONOGRAPHIC INFLATION RATES

The above method of allocating monographic library-resource units is only useful if the unit costs can be accurately predicted. Internal measurement of monographic inflation has in fact proven to be surprisingly close. Using internal cost records broken down by funding unit from fiscal year 1972-73 on, the cost of a monographic library-resource unit in 1975-76 was predicted to be \$12.23. In fact it turned out to be \$12.14, a difference of nine cents. Costs of \$12.69 were predicted for 1976-77. The true cost was \$12.77, a difference of only eight cents. In 1977-78 the projected cost fell short of actual cost by \$1.13, \$13.37 as opposed to \$14.50, but this was well within an accuracy range of 10 percent.

When the unit cost projections are examined on a fund-by-fund basis, there is some scatter from the predicted amounts, but the results are still accurate enough to give a reasonable idea of how many library-resource units a given funding unit budget will buy. The 1976-77 and 1977-78 results for PSU's thirty-six disciplinary funding units are shown in tables 1 and 2.

The funds, of course, vary greatly in size. When table 1 is adjusted for the number of monographs purchased in each fund, the accuracy of the projections is seen to be even greater than suggested by the table.

The tables suggest that accuracy is improving with experience. In general, the larger the fund and the more clearly defined the discipline, the easier it is to project future unit costs. History and biology, for example, were projected to \$13.14 and \$26.35 in 1977-78. Actual unit costs for these funding units were \$12.87 and \$26.49,

TABLE 1  
PROJECTION ACCURACY BY FUND

Unit Cost Range	1976-77		1977-78	
	Number of funds	Percent of funds	Number of funds	Percent of funds
Within 10% of estimates:	16	44.4%	20	54.1%
Between 10% and 20%:	11	30.6	12	32.4
Between 20% and 30%:	5	13.9	1	2.7
More than 30%:	4	11.1	4	10.8
Totals:	36	100.0%	37	100.0%

TABLE 2  
PROJECTION ACCURACY BY NUMBER OF MONOGRAPHS

Unit Cost Range	1976-77		1977-78	
	Number of vols.	Percent of vols.	Number of vols.	Percent of vols.
Within 10% of estimates:	6,156	59.3%	5,035	66.8%
Between 10% and 20%:	2,897	27.9	2,103	27.9
Between 20% and 30%:	584	5.7	130	1.7
More than 30%:	741	7.1	275	3.6
Totals:	10,378	100.0%	7,543	100.0%

respectively. Smaller or less well defined disciplines prove to be more difficult to predict. Costs for theater arts and systems science were projected at \$12.52 and \$16.44. Actual costs in 1977-78 were \$10.94 and \$19.29.

#### CONCLUSION

In the absence of a generally accepted budget allocation formula, the actual allocation of book budget funds is often based on arbitrary power relationships within the college or university. Even if the allocation process is carried through with total goodwill and general agreement on all sides, differing rates of inflation can undo an agreement in two or three years if it is made in

terms of dollars instead of proportions.

The method of allocation outlined above has two distinct advantages over methods that simply reflect academic power relationships. The first is that it neutralizes inflation with surprising effectiveness. The second, and perhaps more important, advantage is that it can be a step toward making faculty accustomed to thinking about book budgets in terms of units of what is being purchased instead of in terms of money. We do, after all, note "a dozen eggs and a quart of milk" on our grocery lists, not "eggs, 73¢; milk, 46¢." Substituting the "library-resource unit" concept and proportional allocations for simple dollar distribution could be a step toward rationalizing how resources will be distributed in the future.

#### REFERENCES

1. Joseph J. Kohut, "Allocating the Book Budget: A Model," *College & Research Libraries* 35:192-99 (May 1974).
2. See the letter by William E. McGrath and the response by Joseph J. Kohut, *College & Research Libraries* 35:370-71 (Sept. 1974); Steven D. Gold, "Allocating the Book Budget: An Economic Model," *College & Research Libraries* 36:397-402 (Sept. 1975); Joseph J. Kohut and John F. Walker, "Allocating the Book Budget: Equity and Economic Efficiency," *College & Research Libraries* 36:403-10 (Sept. 1975); and letter by Steven D. Gold, *College & Research Libraries* 37:369 (July 1976).