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# Break Even Analysis: Tool for Budget Planning (Revised)<sup>1</sup>

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In recent years, the application of the tools of modern business and public management to human service administrative problems has become increasingly sophisticated. PPBS, Management by Objectives, PERT, GANTT, and other facets of management technology have all been set forth in this context.<sup>2</sup> However, the pattern of adoption of some of these innovations should be cause for concern by those who advocate them. In all too many instances, these innovations are preceded by exaggerated claims for their potential, then followed by gradual disillusionment and negativism, and finally virtually abandoned. Such, for example, appears to be the history of recent social service involvement with PPBS - the exaggerated claims of its capacity to depoliticize the political process appears to have been closely tied to its demise.<sup>3</sup>

It is important, therefore, that future proposals for needed management innovations carefully avoid excessive build-ups and incorporate realistic assessments of the potential of the innovation for the field. In this article, the author has tried to set forth Break-Even Analysis (BE) in such a manner. His experience as an administrator and as a teacher has shown him the difficulty of making sense out of the complex financial patterns of the multifunded human service agency, and this article explores as thoroughly as possible some of the important questions raised by the problem of multiple funding. The technique presented here can be no substitute for adequate and responsive agency monitoring and evaluation and decision-making processes, particularly related to budget-making. It is not an ideal system, for there can be no such thing in this area. However, Break-Even Analysis offers a compact, easily administered "early warning system" that can allow administrators to detect fiscal opportunities and problems months - in some cases, years - in advance of their actual onset.

What is presented here will not be new to many administrators in the field who already routinely conduct similar analyses. For them, this Break-Even Analysis may serve as a checkpoint with which to compare their own systems. For novice administrators, as well as for those still frustrated by the problem of multiple funding, the schema laid out here may serve as a model in several senses. It could probably be adapted to virtually any social service agency today with little or no modification, and the questions and issues addressed may serve as a departure point for new and different approaches to the problem.

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<sup>1</sup> An earlier version of this manuscript was published in *Social Work*. 21.4. (July, 1976). 300-307.

<sup>2</sup> For a critique of PPBS, see Aaron Wildavsky, *The Politics of the Budgetary Process* (2<sup>nd</sup> ed., Little, Brown and Co., 1974).

<sup>3</sup> See, for example, Fremont J. Lyden and Ernest G. Miller, eds., *Planning Programming Budgeting: A Systems Approach to Management* (Chicago, Ill.: Markham, 1969); George L. Morrissey, *Management by Objectives and Results* (Reading, Mass.: Addison-Wesley Press, 1970); and Wallace Clark, *The GANTT Chart* (New York: Ronald Press, 1922).

## Multi-Funded Services

To demonstrate the use of Break-Even Analysis, it will be useful to apply the technique to a hypothetical case of the 'multi funding problem' that is commonly found in agencies:

The Happy Valley Mental Health Center serves several rural counties. It is funded by several levels of government, including three different local governments and numerous public agencies. In addition, the agency collects some revenue in the form of fees from clients, as well as a small grant from the local United Way campaign. Some of these funds are general purpose revenues and others are earmarked for specific purposes. The agency's program includes specialized services for drug and alcohol abuse, geriatrics, youth services, retardation, suicide prevention, and grief counseling, as well as the community mental health components of inpatient, outpatient, emergency treatment and consultation services. The agency staff is headed by a three person administrative unit consisting of an executive director, a finance officer, and a program director (who also sees clients part time). The center's complete current financial statement is shown in Table 2. One of the difficult aspect of multiple funding is essentially an informational one: the agency's director as well as the board and some staff members must try to organize the patchwork quilt created by multiple funding and make the agency a single integrated entity with a minimum of duplication, overlap or conflict among programs.

However, the situation itself discourages a unified view. For example, each funding source is principally interested in the accounting of its own funds and only peripherally in the agency's overall fiscal picture. The agency's auditors have institutionalized this pattern, moreover, by recommending a system of 'fund accounts.' This means, in effect, that the financial reports of the organization are little more than a set of independent reports on the income, expenditures and surpluses of eight to ten separate funds.

Thus, even though the agency maintains financial records that are legally and professionally ethical, their usefulness for management purposes is questionable. If the director or anyone else is to determine the overall configuration of revenues and expenditures for the agency, he must first piece together information from a series of separate financial reports.

Under these circumstances, any prospect of detailed or sophisticated financial planning on more than a piecemeal basis is for naught. It would appear that in return for some protection against sudden, catastrophic defunding of the agency, the director must continually operate in a kind of informational haze - somewhat aware of the overall financial direction of the agency, but never being exactly sure. However, the informational deficits and resulting sense of vagueness created by the multi-funded situation are not intrinsic to the situation. They are, instead, the direct result of the lack of a usable set of financial planning tools for synthesizing the appropriate information, all of which is readily available.

Break-Even Analysis offers such a set of tools from contemporary business practice that can be adapted by the human-service administrator in a multi

funded agency. The principal adjustment to be made is a conceptual one: The overriding objective in business is profit, so that the break-even point (defined as the point at which revenues equal expenditures) indicates the beginning of profits. Break-Even Analysis in business can thus be termed directional - that is, it 'looks toward' making a profit.<sup>4</sup>

The objectives of human services organizations are considerably more complex. Because the objective are seldom, if ever solely fiscal, there is the ever present problem of expressing those objectives in fiscal terms - converting dollars into 'human terms.' Even from a solely fiscal point of view, however, the human services concern with breaking even or 'balancing the budget' is bidirectional. As in business, the administrator in human services is interested in income at least sufficient to match expenditures. However, whereas income over expenditure represents profit for the businessman, surplus income in human services is as negative as insufficient revenues because it represents unused resources and is, in effect, an indication of inefficiency or "waste." Thus, excessively large amounts of surplus revenue (an admittedly ambiguous concept in this context) are evidence of poor management. Therefore, the function of Break-Even Analysis in human service agencies is two-fold: to insure that the agency is not overextended financially and to insure that there will not be excessive surplus funds.

## Performing An Analysis

For human service purposes, Break-Even Analysis may be defined as a mathematical technique for projecting and quantitatively manipulating the range of relationships between anticipated expenditures of an agency, program or other financial entity. Such analysis may be either 'algebraic' - manipulation of formulas to solve for unknowns or 'geometric' solving by use of graphs and diagrams. Table 1 outlines a scheme for labeling estimates; in it, the low estimate of total income is labeled A and the high estimate B, while the low estimate of total spending is labeled C and the high estimate D. This scheme is incorporated into the analysis presented in Figure 1 below, which is graphic, since this approach illustrates more clearly the underlying principles and processes involved. Those interested in the algebraic approach can find suitable formulas in any number of business finance and accounting textbooks that deal with BEA. One algebraic approach is noted below with comparative data from Table 6.

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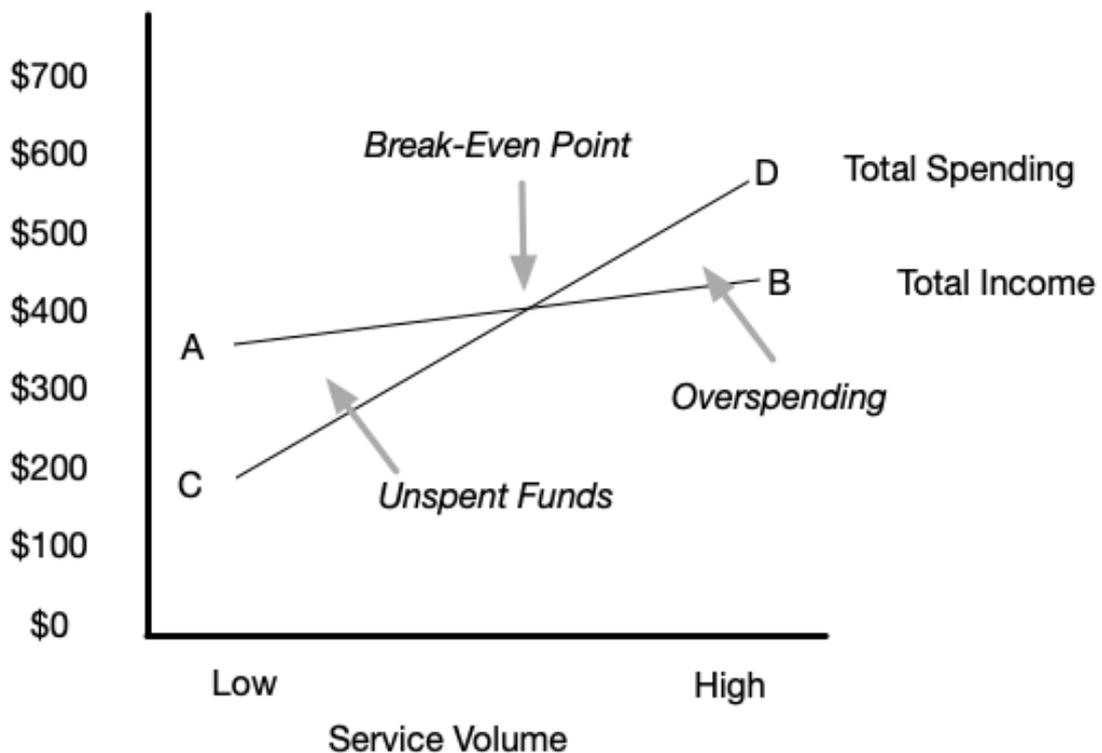
<sup>4</sup> See, for example, J. Fred Weston and Eugene F. Brigham, *Managerial Finance* (4<sup>th</sup> ed., Hinsdale, Ill.: Dryden Press, 1972), pp. 46-66; or Albert Slavin, Isaac N. Reynolds, and Lawrence H. Malchman, *Basic Accounting for Managerial and Financial Control* (Holt, Rinehart & Winston, 1968), pp. 756-763.

Table 1 – Four Estimates

	Low Estimate	High Estimate
Total Income	A	B
Total Spending	C	D

An analysis using graphs can be performed in six steps: (1) estimate fixed income (point A), (2) estimate variable income and add to fixed income (point B); (3) plot points A & B on a graph and connect with a straight line, (4) estimate lowest expected spending (point C); (5) estimate highest expected spending (point D); (6) plot points C & D on the same graph and connect with a straight line. The result should resemble Graph 1

Figure 1 – Graphic Display of Possibilities Using Low and High Income and Spending Assumptions



**Determine Fixed Income.** Estimates of fixed income for a fixed period of time (month, quarter or year, for example) can be made using either a single figure or a cluster of estimates based upon different assumptions about future conditions. The graphic method used in Figures 2, 3, 4 and 5 incorporates several such estimates that are based on present performance, a probable increase, and

a possible decrease for each item. In Figure 2, the fixed income of a grant funded program is graphed, together with a straight-line projection of anticipated expenses up to the break-even point. Figure 3 shows a more complex budget situation, projecting both fixed and variable income and expenses. Note that Figure 3 also adds a scale on the horizontal axis for units of service. Figure 4 shows different components of a multi-funded budget; with the junctions of lines F-F', E-E' and D-D' crossing line A-A' showing (on the vertical axis) approximately where fixed income alone would be sufficient to balance the budget. In Figure 5, a situation is graphed in which there is no possible break-even point. Income increases consistently (graphed parallel with) expenses. The only solutions to this situation would be to reduce income or increase expenses.

Which income items are fixed and which are variable is largely a choice of the analyst, based on the agency's situation. For the Happy Valley Center, grants and appropriations from local government are designated as fixed income and fees and third-party payments as variable income. Under other circumstances, one might wish to differentiate between the 'certain' and 'uncertain' portions of grants and appropriations or seek to establish a certain percentage of fee income as fixed.

There are a number of reasons for separating fixed and variable income. In most instances, for example, they can be expected to change at different rates in the future. In this case, a fixed percentage increase (and decrease) method was used to predict changes in fixed expenditures whereas various assumptions were used to predict future variable income for different items.

Since there is much empirical evidence to support the concept of fixed increments of increase in appropriations and grants, it is ordinarily reasonable to make such assumptions for Break-Even Analysis. In this case we have assumed that each fixed income item (and the total fixed income) will increase by approximately 10 percent from our high estimate and decrease by approximately 10 percent from our low estimate. In this way, we have three estimates for future performance of fixed income - the present level, a 10 percent increase and 10 percent decrease.

If all the income for a multi funded agency comes from grant and fixed sources, the problem of analysis would appear to be a simple one, since the budgets of most grants are already balanced at the break-even point when they are submitted for review. However, life in the multi funded agency is seldom so simple. In particular, the introduction of income from fees (in which there is likely to be a linear relationship between the performance 'output' of the organization and the revenue 'inputs' generated) is the point at which break-even analysis becomes most critical. Other 'unbalanced' income situations (not automatically matched to expenditures) such as gifts, bequests, corporate contributions and the like, tend to further complicate matters.

**Determine Variable Revenues** Once the fixed income has been determined, the more complicated and more artful estimation of variable income begins. In some cases, such as a school with a fixed enrollment or a service program accepting only a fixed number of clients, variable income can be determined simply by a

straightforward multiplication of the tuition or fee rate times the number of students, clients or units of service to be delivered.

In cases of reimbursement on a sliding scale, however, or when the number of fee-supported clients varies widely, estimating variable income is frequently little more than a matter of making educated guesses. The 'softness' of such estimates will, of course, have an effect on the accuracy of the analysis. However, there are some steps that can be taken to insure the greatest accuracy possible under the circumstances. For one thing, if there are a large number of fee-paying clients involved, it is unlikely that there will be extreme variations from year to year so that past performance may be taken as a basis for future expectations. Likewise, making at least two if not a series of estimates is frequently helpful in establishing a general trend in the analysis. Finally, the analyst should not forget to include as variable income any one-time sources of income anticipated for the period, such as bequests or a foundation grant.

The figures in Section B of Table 2 were all derived by assuming various plausible possibilities in the Happy Valley Center. The high-fee estimate is based upon the maximum performance of the present staff and of additional staff as proposed in grants listed in Section A (with the present ration of fee to nonfee patients). The low fee estimate is based on present staffing patterns and a decreased ratio of fee-paying patients due to economic recession. The high Medicaid estimate is based on the assumption of an increase in utilization by Medicaid patients; the low in anticipation of a proposed new regulation restricting mental health services. High Medicare estimates assume a slight increase in utilization; the low estimates allow for the possible enactment of a resolution presently in a Board of Directors committee to withdraw entirely from Medicare participation. The private insurance item is based on a high estimate of increased utilization and a no-change condition (simply rounding off this year's performance).

Presentation of the fixed and variable income items in a single table like Table 3 is likely to ease the task of interpretation for board members, staff, and others involved. Using sub-totals and balances is a sound way to show numerically what the graph shows in linear fashion.

**Graph the Income.** The revenue items can now be plotted on a graph. Figure 1 shows a break-even graph of the grant and appropriation income and the total expenditures. The vertical axis is a scale of rounded dollars in amounts. The scale should be extended by one interval both below the lowest estimates of income and expenditures and above the highest estimates. The range of assumptions on which the estimates are based is plotted along the horizontal axis. This figure shows only two assumptions about the grant and appropriations income - the high and low estimates shown in Table 2. By their very nature, fixed revenues would ordinarily appear as a straight line parallel with the base of the graph. Fixed and variable revenues combined result in a straight line moving upward from left to right from the lowest combined estimate to the highest.

The reader will note here that two discrete estimates of variable revenue ('high' and 'low') were used to graph a continuous linear estimate. Thus, the line,

in effect, expresses in shorthand fashion what it would take a near-infinite number of separate calculations to show - namely, all of the possible combinations of fixed and variable revenues that the agency might encounter in the coming year. This data (which can only be obtained from the graph) is the first significant insight provided by this technique, and its uses for agency planners are multiple.

**Determine Expenditures** The next step in the analysis is to repeat these estimating procedures for expenditures. As with income, it may be helpful to differentiate between fixed and variable expenditures, although this may not be necessary or useful in all cases. Expenditures can also be summarized in a single table. It does not matter whether the categories listed are line items or functional or program classifications as long as the list is a complete reflection of the anticipated agency expenditures. The fixed expenditure column should contain all agency expenditures that are certain and continuous over the period under analysis. The variable expenditures column should be reserved for two types of items: those about which there is uncertainty (such as changes in personnel, the creation of new programs, and so forth) and those which can be varied by executive direction (such as travel expenditures, consultation, conferences, and the like). Under some circumstances, the analyst may wish to handle these in separate columns and as separate linear entries on the graph.

Representing the expenditure patterns of the entire agency in a single table as was one in Table 3 may lead to some difficulties. When combining programs, the analyst should be careful to fit proposed expenditures together as accurately as possible. (Grants may be written at salaries higher than those actually paid to staff working under them; staff members may be funded from two or more grants; and so forth). The general rule here as elsewhere in financial reporting is to report a given expenditure only once. The end result should be the most accurate possible estimate of total agency expenditures.

Table 4 shows detailed breakdowns of anticipated income and expenses and actual and projected columns. This kind of breakdown is often also the best way to begin distinguishing between fixed and variable income and expenses. In this case, for example, variations in variable income and expenses are the principal difference between the low and high estimates in each area, fixed expenses being, as the name suggests fixed (non-varying) over the term of the budget period.

**Graph Expenditures** An expenditures line should now be plotted to accompany the income line already graphed in Figure 1. When using estimates of both variable and fixed expenditures, combined the fixed expenditures with the sums of all the lowest estimates of variable expenditures at a point on the left margin, and then with the highest variable estimates at a point on the right margin. Connect them with a straight line. These points - the high and low 'outer limits' - for both the income and the expenditure items should be in the same vertical axes, that is, directly above one another on both sides. If high and low estimates were used as in Figure 3, simply enter these points to the left and right accordingly. The break-even point - the theoretical point where the assumptions regarding income and expenditures coincide - is the point where the

two lines intersect. Determining the value of this point is simply a matter of reading its location on the vertical axis.

This value, hypothetical as it is, represents a solid estimate of the recourses necessary to do what has been proposed. It is also the basis for a number of manipulations and decisions. For example, comparing this break-even point with fixed income figures is a way of gauging the minimum additional income which must be generated before program cutbacks are necessary. By adding each of the components of income and expenditure estimates as shown in Figure 4, certain additional contingencies can be examined.

Conclusions that can be drawn on the basis of this analysis include the following:

1. Grant income alone is not sufficient for the most generous of the expenditure assumptions (line E-E') although they will cover expenditures at lower estimates. If grant income is to be utilized, expenditures will have to be limited to around \$550,000.

2. When fixed and variable estimates are considered together, revenue estimates (line C-C') exceed expenditure estimates (line E-E') at all points with the size of the excess directly related to the totals (the lower the estimates the greater the excess.)

3. Even if we average the high and low expenditure estimates (and add a line connecting A-B') there is still a surplus shown, although it is not as great as that for the total combined revenue estimates.

Some of the implications of this for agency performance are as follows:

1. If variable revenues tend toward the lower estimates, it may not be possible to implement all proposed expenditures, since grants alone will not cover them.

2. The 'normal' expectations graphed here show the agency with some surplus revenues - the amount varying with the amount of variable revenue. If expenditures are less than anticipated, the surplus could be considerable (as measured by the gap between C-C' and E-E'). At the midpoint on the graph possible surpluses appear to be from \$40,000 to \$70,000. Thus, it may be possible to devise some contingency plans for expending those funds if variable revenues are high. (Of course, some of those funds may be 'frozen' and un-expendable according to grant requirements.

3. The most significant implication of these figures, however, is that they replace 'seat of the pants' administration and 'guesstimates' of the agency's anticipated financial position with exact and reasonably trustworthy calculations. That is, it becomes possible to replace the purely qualitative judgments - "We're going to have too much" or "We won't have enough" - with more exact estimates. Such estimates, carefully monitored, offer an 'early warning system' that can alert the administrator to the opportunity (or need) for contingent plans. They can also serve as a benchmark against which to measure actual events when deciding if and when the plans should be implemented.

Thus, even in the simplified form outlined here - which amounts to little more than an amalgamation of separate budget items and graphs of the results - Break-Even Analysis should provide the multi funded human services agency with a number of useful insights into its expected overall performance.

## Variations

In addition to its own usefulness, however, the basic Break-Even method outlined above provides the format for a number of variations. For example, once the basic table is constructed, the analyst may wish to tinker with a variety of continuations of revenue and expenditure assumptions simply to test their effects upon the agency's stability of funding. He might completely eliminate one or more revenue sources or search for some optimum, such as the lowest surplus consistent with realistic expectations for both revenue and expenditure.

A second, more complex method of refining the expenditure estimates involves plotting the minimum fixed expenditure point at the left and then introducing one by one the major components of variable expenditures in appropriate combinations. The order and groupings are up to the individual analyst, but it may be useful to introduce them in roughly their order of priority or plausibility. The analyst may also want to experiment with introducing the items in different orders representing different priority assumptions. This method is considerably more difficult to produce, but it may also yield significantly greater insights since expenditures seldom actually increase in the gradual manner represented by the linear model. (This is largely due to what economists call 'economies of scale.' For example, managers can seldom hire people at salaries and hours that are exactly in line with their budgets. Most often, they must either hire an additional staff member at a given salary or not hire anyone.)

A third variation that may also be utilized under certain circumstances is to include all expenditure items as fixed except for a small number of selected items. These may then be introduced singly or in combinations to test their effect upon the break-even point. This 'incremental' or 'marginal' approach may be more useful at an advanced level, for example, after some of the other variations have already been prepared.

One happy discovery along the way is that Break-Even Analysis methods also make it possible to estimate the impact of sliding scale fees, like those shown in the sliding scale fee table shown in Table 5, on budget projections although it may take those preparing the budget a lot of careful thought to sort this through: Sliding scale fee effects on an agency budget are directly analogous to the business situation of "discounts" and can be handled accordingly in the budget.

Altogether, variations in Break-Even Analyses fall generally into the following categories:

**Variant A.** Assume a fixed revenue level (the high or low estimate or the break-even point) and vary expenditures - perhaps by including or excluding new programs or proposals

**Variant B.** Assume a fixed level of expenditure and modify, one at a time, various components of revenue.

**Variant C. Unit Cost Method.** If data are available on standard costs for units of service delivery or other output measures, these may be used as the horizontal axis. (This variant comes closest to the business model and yields the most sophisticated results. Unfortunately, only a few social agencies at present have reliable unit cost data which can be employed.)

**Variant D.** The “excess revenues” category (the part of the revenues line that is above the expenditures line) can be partitioned into various sub-categories. For example, one may wish to determine the portion of excess revenues arising from gaps between actual salaries and those budgeted in grants (which may well be only a fictitious surplus in many cases, since grant requirements may preclude spending these funds).

## An Approach With Formulas

Although the graphic approaches shown in this article are useful for illustrating the underlying ideas and concepts of applying Break-Even Analysis to human services budgeting, the more conventional approach is through the use of algebraic formulas. Although numerous possible formulas can be deployed, only a single one will be introduced and discussed here.

$$U_T = \frac{F_T}{P - V_{CU}}$$

Where  $U_T$  equals the total number of units of service necessary to break even;  $F_T$  equals total fixed costs;  $P$  equals the unit price (or fee charged) and  $V_{CU}$  equals the variable cost per unit (or what is often identified as the contribution margin). From the combination of known and unknown quantities in a given situation, it is ordinarily possible to solve for the unknowns. Thus, the four scenarios show in Table 6 show an original B-E Analysis and three variations. In all cases, it is assumed that 100 units of service are to be delivered.

## Earmarking Over Time

Once the necessary data for a break-even analysis are gathered together, the agency analyst also has the beginning of a time-series analysis. Time series break-even analysis is similar in approach to the above, but is directed at a different problem, which is similar, from the agency’s viewpoint, to cash-flow problems. The human service organization, like all enterprises, must be concerned that its cash reserves can always cover overflow. There are also strong ethical, legal and professional sanctions against such organizations - particularly the private nonprofit organization - operating at a loss or ‘in the red’ for even a brief period. Their situation in such circumstances is identical with that of the individual consumer who overdraws his checking account. Since such

organizations typically have no significant capital reserves, the human services organization manager must also be concerned with maintaining a comparatively positive ratio between assets and liabilities, in addition to maintaining a positive cash flow ratio. Although many agencies maintain some type of contingency or 'slush' funds for such situation, this is seldom more than an emergency, stop-gap measure and cannot be relied upon for extended periods. This problem is particularly troublesome for the manager of the multi-funded agency, who may be facing major changes in funding such as grant expirations more or less constantly throughout the operating year.

The time-series adaptation of break-even analysis allows the manager to forecast with considerable accuracy whether his relevant assets will be sufficient to cover his liabilities at any time during the year. By repeating this analysis for monthly or other periodic intervals over a year's time, and taking into account the anticipated expirations and initiations of various funding, the inception and completion of various projects, and other fiscally significant events, the human services manager should be able to isolate potential trouble spots and initiate appropriate action. In graphing a time-series analysis, the time intervals are plotted along the horizontal axis.

The same format can be used in long-range planning as well (five-year, or ten-year projections, for example). However the user should note that the accuracy, validity and reliability of the resulting predictions may be limited by the many assumptions that must be made to project that far in the future.

## Two Caveats

The limitations of the assumptions made, along with the failure of Break-Even Analysis to be sufficiently responsive to the problem of earmarking, prompt two major caveats for those planning to use this technique. Like all such mathematically based methods, this technique involves some simplification and abstraction from reality. The care and accuracy with which simplifying assumptions are made and their fidelity to the realities they represent will, of course, directly affect the performance of the technique. No such analysis can be expected to yield 'perfect' predictions. Generally, however, as with all modeling the better the assumptions the better the results.

The most significant simplifying assumption in break-even analysis is that of linearity - the notion that the complex nuances of change in revenues and expenditures can be captured by a straight line. The two-fold high/low approach illustrated here is particularly susceptible to inaccuracies resulting from its linearity. An analysis based on unit cost data in which incremental values could be assigned along the horizontal axis would be considerably less susceptible to this particular problem. So long as the analyst recognizes, however, that this estimate is a ball-park guesstimate (BPG) rather than an exact prediction and that the real difference may vary from this figure, he is free to concentrate on the potential usefulness of the data. (The actual variance, for example, is seldom likely to be so large that such general qualitative predictions as 'We will have a large surplus' or will be nullified.)

The second limitation to be noted is the perennial problem of earmarking for the multi-funded agency. That is, various funding resources may stipulate that the funds be expended only in designated activities. The principal effect of this in Break-Even Analysis is that a surplus that appears in an analysis may, in fact, be all but unusable by the agency because of stipulations attached to those funds. (For example, there may be \$100,000 in apparently surplus funds, but if this is all earmarked to support the hiring of four professional staff members and suitable candidates cannot be found, there is little that can be done to reallocate and utilize those funds.)

Break-Even Analysis can possibly contribute to solving this problem. For one thing, conducting a BEA presents an opportunity to analyze the entire agency picture with respect to such reserved-but-unused funds. It may be possible to renegotiate with grantors and gain permission to reallocate the unused funds. Second, the analysis may be taken one additional step by 'partitioning the gap', that is, dividing the total surplus revenues into two categories - earmarked and unencumbered funds. The same process can be applied of course, in the case of a deficit, although the uses would be somewhat different. The main point, however, is that the analyst should never be lulled into concluding that all funds which show up on an analysis as "surplus" can automatically be reallocated to new and additional purposes.

If the analyst keeps these two caveats in mind in interpreting the results of an analysis, this technique should yield useful and valuable results for the human service agency.

In attempting to demonstrate the application of Break-Even Analysis and some possible variations to human service agencies, this article has, of necessity, only scratched the surface. It is possible, as noted, to perform an analysis algebraically as well as using graphs, although some of the necessary conversions from business practice may prove troublesome with some agencies accounting systems.

Equally important as the technique itself, however, is the problem to which it is directed: the double-edged significance of deficits and surpluses in human service settings. The human services administrator can ill afford to have either too little or too much in the way of financial resources. Break-Even Analysis is one practical way of identifying and defining both problems.

**TABLE 2.**  
**FINANCIAL STATEMENT OF HYPOTHETICAL MENTAL HEALTH CENTER**

Income		Expenses	
Income from Fees	\$100,900	Total Salaries	\$500,000
Green County	45,500	Administrative & Clerical	(75,000)
Brown County	40,500	Professional	(260,000)
Amber County	16,500	Paraprofessional	(125,000)
Yorkville City	10,500	Total Fringe Benefits	(40,000)
Greenville	90,000	Office Rental	38,000
Brownsdale	13,500	Supplies and Equipment	10,000
Amber Village	4,500	Travel	80,000
National Institute of Mental Health Agency	245,000	Telephone	18,000
Bureau of Reclamation	100,000	Fees Absorbed by the Center (Uncollected Accounts Receivable)	5,000
Social Service Bureau	10,000		
<b>Total</b>	<b>\$676,900</b>	<b>Total</b>	<b>\$651,000</b>
		Surplus/Deficit	+ \$25,900

**TABLE 3.  
ACTUAL AND PROJECTED INCOME AT  
HYPOTHETICAL MENTAL HEALTH CENTER**

A. Income from Grants and Appropriations	Actual	Projected	
		High	Low
Green County	\$45,500	\$50,000	\$40,000
Brown County	40,500	45,000	36,000
Amber County	16,500	18,000	15,000
Yorkville City	10,500	12,000	9,000
Greenville City	90,000	100,000	85,000
Brownsdale	13,500	15,000	12,000
Amber Village	4,500	5,000	4,000
National Mental Health Agency	245,000	245,000	235,000
Bureau of Reclamation	100,000	105,000	95,000
Social Service Bureau	10,000	5,000	0
<b>Total</b>	<b>\$576,000</b>	<b>\$600,000</b>	<b>\$531,000</b>
B. Income from Fees and Third- Party Payments	Actual	Projected	
		High	Low
Fees Collected from Clients	\$21,000	\$24,000	\$17,000
Medicaid	68,000	75,000	60,000
Medicare	2,100	2,300	0
Insurance Carriers	9,800	15,000	10,000
<b>Total</b>	<b>\$100,900</b>	<b>\$116,300</b>	<b>\$87,000</b>
<b>Total Revenues, All Sources</b>	<b>\$676,900</b>	<b>\$716,300</b>	<b>\$618,000</b>

**TABLE 4.  
DETAILED BREAKDOWN OF EXPENDITURES AT  
HYPOTHETICAL MENTAL HEALTH CENTER**

Salaries (including fringe benefits	Actual	Projected	
		High	Low
Administrative and Clerical	\$75,000	\$69,500	\$59,000
Inpatient Services	139,500	150,000	20,000
Outpatient Services	255,000	290,000	275,000
Substance Abuse Services	133,000	100,000	90,000
Emergency Treatment	10,000	15,000	5,000
Consultation	1,000	2,500	100
Geriatrics		10,000	10,000
Youth Services		1,000	
Developmentally Disabled		1,000	
Suicide Prevention		1,000	
Grief Counseling		1,000	
<b>Total</b>	<b>\$613,500</b>	<b>\$641,000</b>	<b>\$459,100</b>
Office space (rent & utilities			

TABLE 5. A SLIDING SCALE FEE SCHEDULE

Income Level	Fee (\$) per Family Size			
	One Child	Two Children	Three Children	Four or More Children
200% of poverty level or higher	100	80	60	40
150% of poverty level	50	40	30	20
100% of poverty level or lower	0	0	0	0

Note: Full fee = \$100.

**FIGURE 2:  
BREAK-EVEN GRAPH OF A GRANT-FUNDED PROGRAM**

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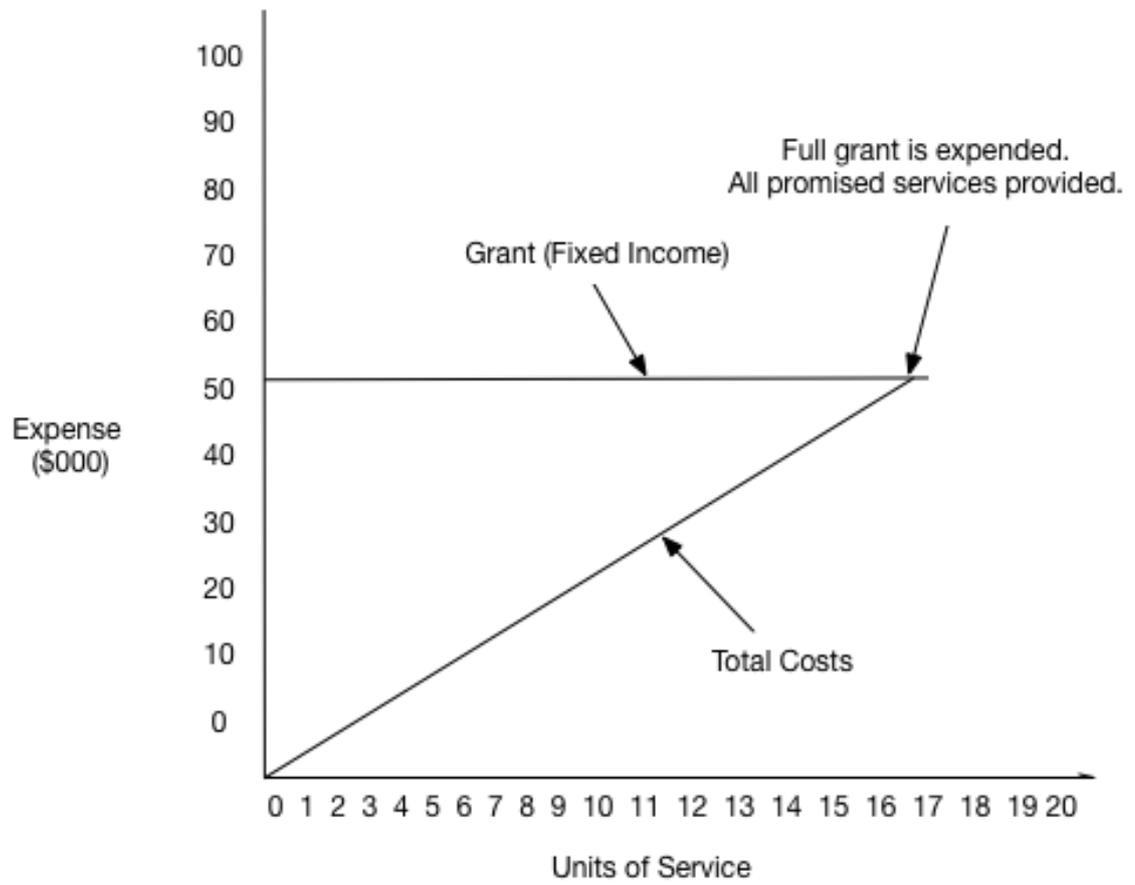


FIGURE 3: BREAK-EVEN GRAPH OF  
FIXED AND VARIABLE INCOME AND EXPENSES

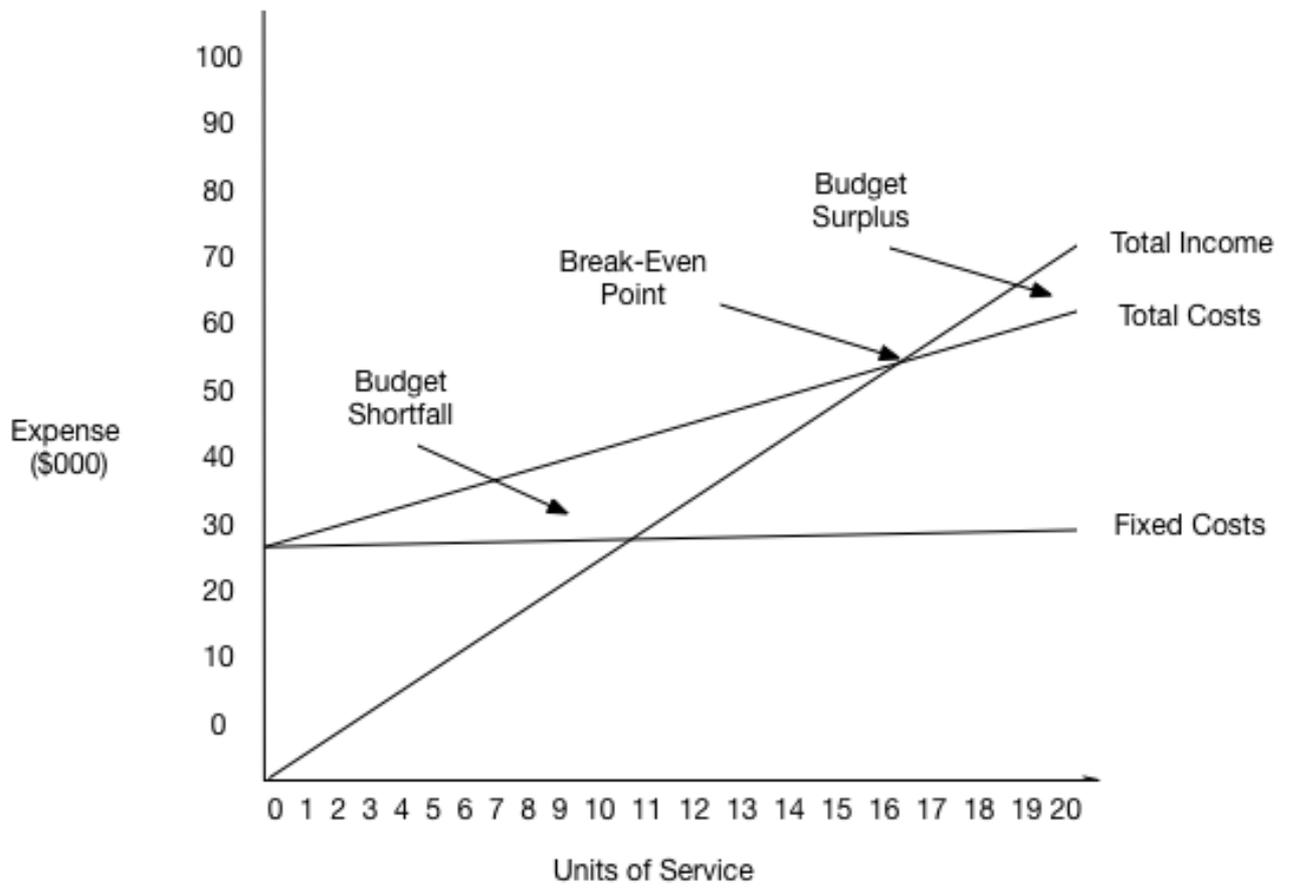
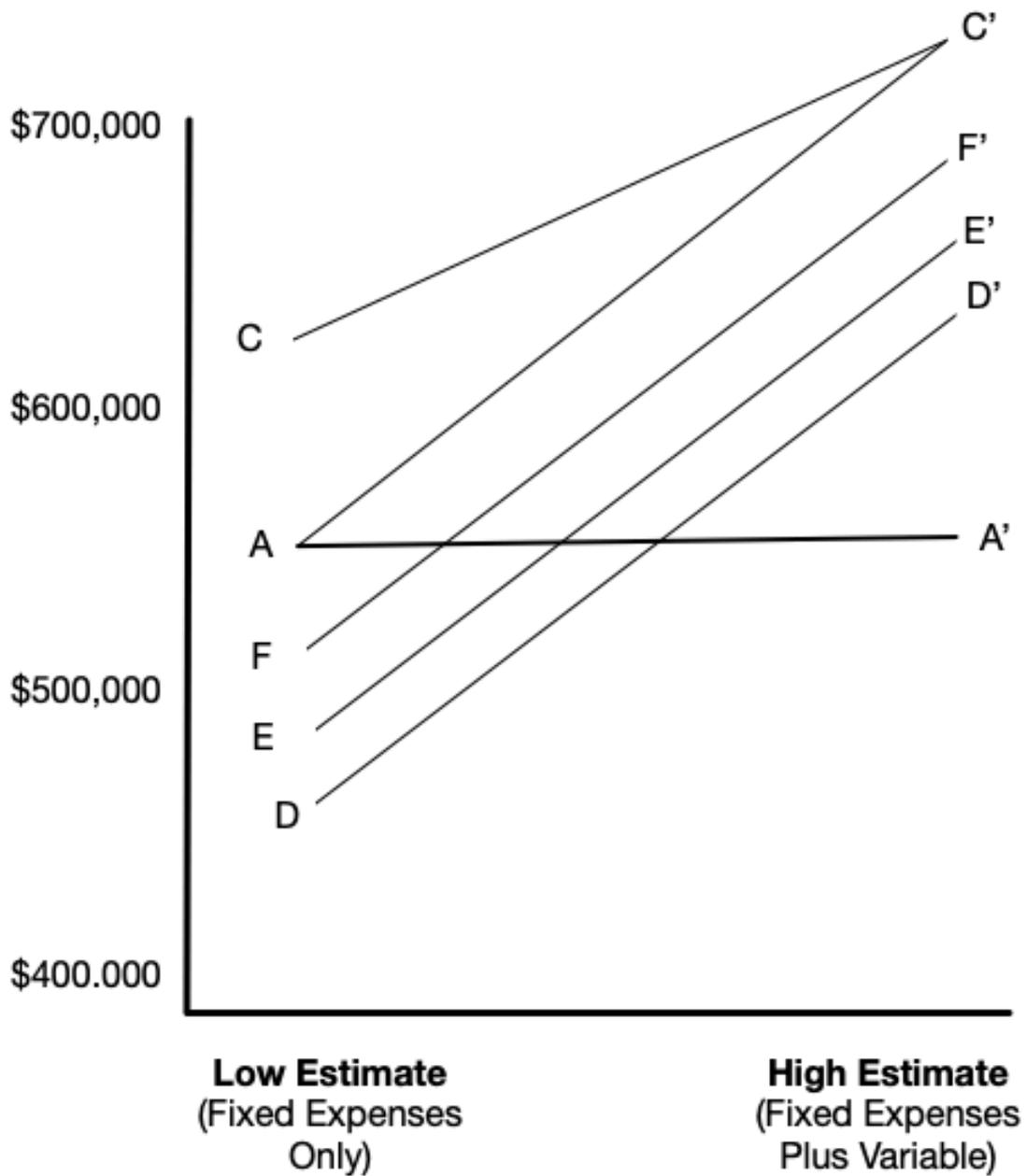


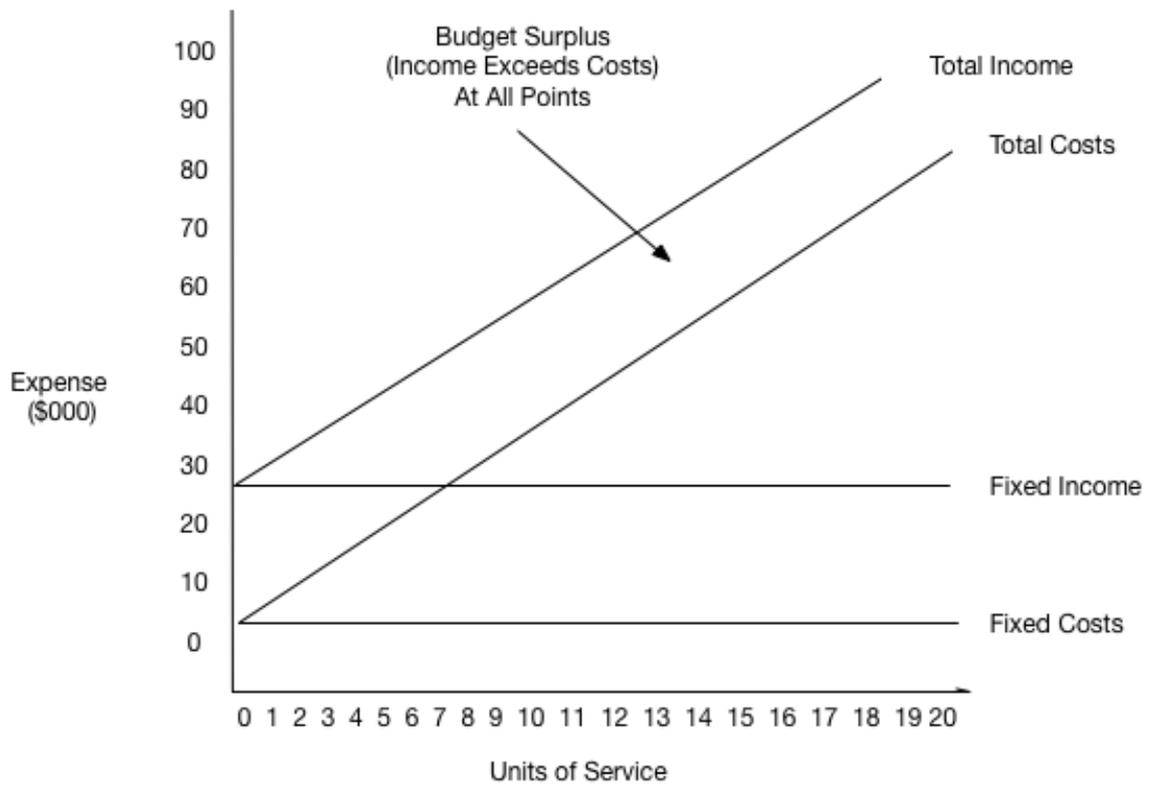
FIGURE 4: GRAPH OF COMPONENTS OF A MULTI-FUNDED BUDGET



**KEY:**

- A-A' – Total Fixed Income
- A-C' - Total
- B-B' – (Not Shown)
- C' – Break-Even Point (Total Income = Total Expenses)
- C-C' – Total Income
- D-D' – Human Resources Expenses
- E-E' – Human Resources & Office Space Only
- F-F' – Total Expenses

**FIGURE 5: BUDGET PROBLEM WITH NO BREAK-EVEN POINT**



**TABLE 6: FOUR BREAK-EVEN SCENARIOS**

<b>Category</b>	<b>Option A (Original): (\$)</b>	<b>Option B:75% (\$)</b>	<b>Option C (\$)</b>	<b>Option D (\$)</b>
Fixed costs	281,233	281,233	210,925	281,233
Variable cost/unit	45	27.55	27.55	53
Fee/unit	100	100	100	100
Break-even quantity	5,113	3,882	2,911	5,983
Total variable expenses	230,099.97	106, 942.29	80,206.72	317,135
Total income	511,333.27	388, 175.29	291,131.47	598,368
Total expenses	511.333.27	388, 175.29	291,131.47	598,368
Cost/unit	100	100	100	100