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Prudent fiscal stewardship: Estimating the expected monetary value of an educational program

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Academic administrators are frequently asked to make difficult decisions related to resource allocation. Should a new academic program be approved? Should an old program be discontinued? How should resources be allocated between programs? Although resource allocation decisions are based on many factors, administrators must always consider the financial implications of their decisions. To that end, this paper illustrates one approach that administrators can use to estimate the expected monetary value of their educational programs. The paper begins by providing a brief overview of the relevant cost and revenue factors that are involved in resource allocation decisions. The paper then illustrates how a private, regional university used this approach to estimate the monetary value of an ongoing international education program. The paper concludes with a discussion of the managerial implications associated with making resource allocation decisions based on economic value.

Resource allocation, expected monetary value, budget, marketing, accounting

INTRODUCTION

The criteria used by an educational institution to evaluate its products (programs) are often more complex than those used by traditional for-profit organisations, and the bottom line is harder to define (Blocher, Chen, and Lin, 2002; Dickeson, 1999). Among the factors that can complicate the evaluative process are the not-for profit status of the institution; a mission or vision that often includes social or community ideals; a diverse constituency base; and a complex network of interdependencies that exists between various programs being offered at the institution. Complex tradeoffs are involved in such basic decisions as supporting small classes that may enhance student learning yet are also financially more expensive.

Of the 13 million undergraduates attending college in the United States, only 400,000, or three per cent, attend for-profit schools (Sachdev, 2003). Although not-for-profit status relieves decision makers of having to provide investors with a satisfactory return on their investment, a responsible steward of the not-for-profit organisation must still manage the organisation's resources in a manner that enables it to fulfil its mission. Dickeson (1999, p. 29) described mission within the field of education as 'the academic grid against which all evaluation of programs must be measured' Although community welfare and meeting the requirements of external accrediting bodies are essential to most educational institutions, if the organisation's mission contemplates that it will be an ongoing enterprise, then administrators are compelled to consider both the intermediate and long-term financial implications on their decisions. This almost certainly comes as no surprise to any administrator who has budgetary responsibility.

In order to illustrate how an administrator can estimate the financial implications of a decision, this paper demonstrates how a private regional university calculated the expected monetary value (EMV) of one of its on-going international programs. The LBS program, as it is referred to in this paper, is an undergraduate program designed for business administration majors and minors. Faculty members from the university's College of Business apply to direct, and teach in, the program. Students apply for admission to what has become, over the years, a very competitive program. For the first three years, the program comprised one faculty member who led 25 to 30 students to study overseas for a semester. Since 1998, the program has been expanded to two faculty members who lead a group of 45 to 53 students. From the students' perspective, the cost of the program, including tuition, prearranged home stays, and airfare is very similar to that of studying for a semester at the home campus. Weekend travel and entertainments costs, however, often add substantially to the actual out-of-pocket costs for the students. Faculty assigned to the program are responsible for teaching two classes each while they are overseas. This compares to a three-course teaching load at the home campus. The university also covers the cost of housing for the faculty, transportation expenses, and miscellaneous expenses amounting to approximately $800 per student per semester (based on 50 students).

Dickeson (1999) recommended a ten-point model of evaluating academic programs that considered external demand, internal demand, size, scope and productivity, revenue and resources generated, costs and expenses, history, quality of inputs and processes, quality of outcomes, impact and opportunity analysis. Here we focus our attention on the first five of the ten criteria, which is not to suggest or imply a necessary hierarchy of importance in the criteria but merely to render explicit the scope of our research interests. The first cluster of criteria focuses on external and internal market demand. External demand relates to whether a program draws tuition revenue into the institution. A prospective student's decision to matriculate to the university or perhaps to choose a particular major within the university is an example of external demand. Internal demand relates to whether a program creates enough interest in the mind of a student already enrolled in the university to continue at the university rather than to consider leaving. This idea of internal demand is often referred to in the academy as 'retention'

The second cluster focuses on three criteria that are closely related to profitability or contribution analysis. The three criteria are (a) size, scope, and productivity; (b) revenue and resources generated; and (c) costs and expenses. In addition, Dickeson (1999) included a number of subcategories of revenue. One, entitled 'potential revenue, 'posits that programs of any type, but especially those that involve a unique experience, may create the type of commitment to the institution that results in future gifts or bequests.

Tools of Financial Analysis

The framework used to analyse a program also depends upon whether the program is proposed or is currently being offered by the institution. Although the financial implications of both newly proposed and ongoing programs are of concern to academic administrators, the focus here is on the analysis of existing programs. We begin with a brief discussion of the most basic components of such an analysis.

Revenues

The most basic financial analysis of a program begins with an identification of its associated incremental revenues – revenues that would not arise if the program were not offered. For example, in a program such as LBS, incremental revenues are, in part, comprised of the stream of tuition dollars paid by students who matriculate to an institution as a direct consequence of the availability of the program (whether or not they eventually apply for or are accepted into the program), as well as any revenues retained through improved retention rates. The revenue stream

is, of course, much more complicated in that it may also include room and board, miscellaneous registration fees, bookstore sales, and future alumni donations. In addition, there may be indirect revenue benefits (e.g., friends who matriculate with students who are attending the institution due to the availability of the LBS program) as well as positive word-of-mouth effects on other potential students. Although it may not be practical to estimate all sources of revenue, it is important to understand the revenue and cost implications of a particular analysis in order to assess whether the final financial estimate tends to overstate or understate a program's actual monetary contribution.

Costs

The term 'cost assignment' is the process of first assigning costs (or cost elements) to cost pools, then from cost pools to cost objects (Blocher et al., 2002). Cost pools are meaningful groups of costs defined by an institution for the purposes of managing its programs. Cost pools may be defined by type of cost, source of cost, or responsibility for managing cost. Once pooled, cost assignment becomes the assigning of costs to cost objects, namely, products, services, or other organisational units to which costs are assigned. Here, the cost object is the program under analysis, such as the LBS program.

Relevant costs are those costs that differ between alternatives, such as between two programs or between offering and not offering a given program. Relevant costs are avoidable costs. The capture of relevant costs can at times be more challenging than the capture of revenue information, such as how to treat costs that have already been incurred (e.g., sunk costs). Since the costs have already been incurred, they are unavoidable and therefore not relevant. For example, it is often necessary to incur costs when starting a new program, such as creating an effective and efficient system for managing the program, creating program awareness, and purchasing new equipment. Yet another challenge is the consideration of opportunity costs or the benefits foregone by choosing one alternative over another. For example, when faculty teach in the LBS program they are not, as a consequence, teaching or providing services back at their home campus.

Once relevant costs are identified, they are classified as direct or indirect. A direct cost is easily associated with the program. The cost of copying materials for students in the program would likely be considered a direct cost. An indirect cost is one not as easily associated with a program, for example the university president's salary.

Another cost analysis tool is the consideration as to whether a cost is variable or fixed. A variable cost is one that changes with the level of activity – yet is fixed in relation to each unit of activity. The copying mentioned in the previous paragraph is a variable cost – the more students in a class, the more copying required. Each student receives the same number of copies, so the cost per student is fixed. A fixed cost is one that does not vary with the level of activity – thus, on a per-unit basis, it varies inversely with the level of activity. Faculty pay is an example of a fixed cost – the cost is the same whether one or thirty students enrol. However, as more students enrol, the cost per student decreases.

The 'variable/fixed dichotomy' is often an oversimplification, and other elements of the nature of costs must also be considered. For example, while the faculty cost is, in one sense fixed, it is variable once a 'relevant range' is exceeded. Costs that must be purchased in such increments are 'structural costs' if they must be purchased in large blocks, for example tenured faculty contracts, whereas costs that can be purchased in smaller, more manageable increments are 'executional costs' (Blocher et al., 2002). Consider for example the case in which a program impacts the teaching load of faculty. In the LBS program, faculty teach two as opposed to three classes. As a consequence, the university must hire someone to teach the class that the faculty member would

otherwise teach. In many cases, adjunct faculty members are used to supplement the teaching shortfall, hence minimising the net replacement expense for the institution.

As might be expected, some costs are easier to capture than others. While acknowledging the importance of all costs, the focus is on attention on more of the concrete costs.

Analysis of Existing Programs

A common approach to analysing the financial viability of a program is to determine its contribution margin by subtracting variable costs from revenues. Contribution margin is the amount a program contributes to meeting the fixed costs of the educational institution. Those fixed costs that are identifiable to the program can also be subtracted from contribution margin to arrive at a net income-type value, what we are calling the 'Expected Net Monetary Value' of a program (EMV). The costs included in such an analysis are direct costs only, with no allocation of indirect costs.

It is the identification of the fixed costs of a program that often becomes problematic. Such an analysis typically involves an allocation of an institution's common fixed costs (e.g., the president's salary) to the program. While this may be appropriate in gaining an understanding of what programs can be said to carry the weight of institutional fixed costs, such an allocation is not appropriate in making a decision regarding the continued viability of a program. Such an allocation of the institution's common fixed costs assumes that some portion of the president's salary would no longer be incurred if the program were discontinued – an inaccurate assumption. The determination of EMV must include a subtraction from contribution margin of only relevant fixed costs – fixed costs that will no longer be incurred should the program be discontinued.

This paper approaches the analysis of a program from the perspective of both the university and the operating unit (e.g., college). The proper method of analysis is first to determine the EMV of the appropriate entity (university or operating unit) 'with' and then 'without' the specific program. If the entity's EMV is greater with the program, it should be kept. If the EMV is greater without the program, it should be discontinued, notwithstanding mission-related justifications. The inclusion of allocated common fixed costs, as discussed in the prior paragraph, often apportions an amount of common fixed costs to a program making it appear to have an unfavourable EMV. However, as the common fixed costs (e.g., the president's salary) would be present even if the program were discontinued, those common fixed costs would have to be covered without the contribution margin of the discontinued program. In summary, the costs relevant to a decision to keep or drop an existing program are direct costs: direct variable costs or direct fixed costs.

As previously mentioned, EMV can be calculated for a course offering, a program, a major, or effectively used to facilitate decision making at any level within a given operating budget. It should be noted that when different units of analysis are used, it might result in different decisions concerning the viability or desirability of a given program depending on how costs and revenues are captured for a program. For example, the typical LBS student takes two courses that are designated College of Business courses, one designated College of Arts and Sciences, and one designated 'interdisciplinary'. Thus, two courses of the four, or one-half of the tuition revenues related to the program could be assigned outside of the College of Business. If all of the costs of the program are assigned to the College of Business, then the College of Business has been burdened with 100 per cent of the costs while only being assigned 50 per cent of the revenues.

As a consequence, a program that is costly for the operating unit is overall beneficial for the university. Conversely, if costs are not allocated properly, an operating unit might be encouraged to adopt programs that generate positive cash flows for the operating unit but are costly to the institution at-large.

LBS ILLUSTRATION

In order to illustrate how to calculate the expected monetary value (EMV) of an educational program, a survey was conducted to evaluate the incremental value of an ongoing international program at a regional university. Specifically, three economic issues were assessed. First, to what extent did the availability of an international program impact on the choice of a student to matriculate to a particular university? Second, what impact did the program have on student retention? Finally, what impact did the program have on the student's choice of a major within the university and as a consequence the operating budget of a particular academic unit?

METHODOLOGY

Fifty-four juniors participating in a semester-long study abroad program were asked to evaluate the impact that the program had on their choice to attend and subsequently remain at the university. To this end, a seven-item survey instrument using an incremental scale was administered to assess the impact of the LBS program on the students' decisions. In addition, students were asked to evaluate the extent to which the availability of the academic program impacted their choice of a particular major. Data were also collected pertaining to when the students became aware of the program (pre or post-matriculation) and whether they entered the university as freshmen or as transfer students.

The expected revenue (ER) of the program is specifically calculated using the following formula(s):

Equation 1.1. Expected Revenue of a Program

$$\mathbf{ER_P} = (P_{Mat_n} * Y_n * T_n) + (P_{Ret_n} * (Y_n - 1) * T_n * (1 - P_{Mat_n})) + \ldots$$

$$\ldots + (P_{Ret_x} * (Y_x - 1) * T_x)$$

where

n = number of students aware of program before matriculation;
X = number of students unaware of program before matriculation;
T = average tuition per student per year (net of any tuition discounts);
Y = number of years expected to complete degree at the university after being admitted (for the purposes of this study it was assumed that for entering freshman Y = 4 and for transfer students Y = 3; this analysis also assumed that after matriculation students stay at least one year before retention becomes an issue);
P_{Mat_n} = probability of matriculation attributable to program of interest;
P_{Ret_n} = probability of retention of students that were aware of the program before matriculation;
P_{Ret_x} = probability of retention of students that were not aware of the program before matriculation;
ER_P = expected revenue value of a program.

The ER formula comprises three distinct components. The first component of the formula is represented by the sum of $(P_{Mat_n} * Y_n * T_n)$. In this section, an estimate of the program's impact on matriculation is calculated. For those students who are aware of a program before matriculation, the probability that the program impacted their decision to matriculate is multiplied by the total number of years that the student is expected to be at the university (in the case of a freshman – four years), that product is then multiplied by the annual net tuition revenue per student. In this example, the tuition is net of any internal discount given by the financial aid office (e.g., net of any tuition reduction offered to attract students to the university).

The second revenue component of the formula is represented by the sum of $(P_{Ret_n} * (Y_n - 1) * T_n * (1 - P_{Mat_n}))$. Although the first part of the formula, given by the sum of $(P_{Mat_n} * Y_n * T_n)$ accounts for the effect of matriculation, it does not account for the value of the program on retention. In this part of the formula we take the student's estimate of the probability that the

program impacted on their decision to remain at the university times the number of years that retention is an issue for the student. The formula assumes that retention is not an issue during the student's first year at the university but impacts equally on the student's remaining years at the university.

The formula then multiplies the probability of retention by the product of relevant years at the university multiplied by net tuition dollars. Again, in the current example, the revenue stream is net of tuition discounts. Finally, since an estimate is already included in the ER for the probable value of matriculation, it is necessary to subtract the probable impact of matriculation from the retention estimate. This is accomplished by multiplying the derived retention value by that portion of the tuition revenue not previously accounted for in the matriculation estimate, or multiplying the retention value by one minus the probable impact of matriculation. In order to help illustrate this, consider the following three examples. If the student assigned a zero probability to the program's impact on matriculation but assigned a 30 per cent impact on retention, the full value of the impact of the program on retention is accounted for. By contrast, if an entering freshman attributes a 50 per cent impact on matriculation, and a 50 per cent impact on continuing retention, the net retention impact is adjusted as follows: 0.5 (probable impact on retention) x 3 (eligible retention years) x Net Tuition x 0.5 (one minus 0.5 or the discount assessed so as not to double count the matriculation effect). Finally, if a student attributed a 100 per cent probable impact on matriculation, then any attributed impact on retention is mute since the student would never have attended the university if not for the program of interest.

The third and final component of ER is represented by the sum of $(P_{Ret_X} * (Y_x - 1) * T_x)$. In other words, for those students not aware of the program before matriculation, the student's assessment of the probable impact of the program on retention is multiplied by the number of relevant years at the university times the university's net tuition.

The sum of all three components, summed across all students, is the derived incremental value (ER) for the program of interest.

Equation 1.2. Expected Net Monetary Value of a Program

$$\mathbf{EMV_P = ER_P - DC_P}$$

where

ER_P is defined by Equation 1.1;
DC_P is defined as sum of the direct costs of the program;
EMV_P = Expected Net Monetary Value of a Program;

The expected revenue of a program at the level of an operating unit (e.g., college, school, major, etc.) is calculated using the following formula:

Equation 2.1. Expected Revenue Value at the Level of the Operating Unit

$$\mathbf{ER_O} = \sum_{n=1}^{N} (P_{Mat_n} * A_n * C_n) + \sum_{n=1}^{N} (P_{Ret_n} * A_n * C_n * (1 - P_{Mat_n})) + \ldots$$

$$\ldots \sum_{x=1}^{X} (P_{Ret_X} * A_x * C_x) + \sum_{x=1}^{X} (P_{Maj_X} * A_x * C_x * (1 - P_{Ret_X}))$$

where

n = number of students **aware** of program before matriculation;
X = number of students **unaware** of program before matriculation;
A = Average tuition cost per course (net of any tuition discounts);

C = average number of operating unit courses within a major or within the operating budget of the academic unit making a decision based on the EMV;

P_{Mat} = probability of matriculation attributable to program of interest;

P_{Ret_n} = probability of retention of students that were aware of the program before matriculation;

P_{Ret_x} = probability of retention of students that were not aware of the program before matriculation;

P_{Mat_n} = probability of program impacting choice of major for those aware of the program before matriculation;

$P_{Maj\ x}$ = probability of program impacting choice of major for those unaware of the program prior to matriculation;

ER_o = expected revenue value of a program at the operating unit level.

The ER formula for the operating unit comprises four distinct components. The first three components mirror that of Equation 1.1 except that the revenue portion of the formula is based only on the courses offered within the operating unit. The fourth component, however, measures the value associated with the probability that a student will major in a subject as a consequence of a particular academic offering. This estimate is represented by the sum of ($P_{Maj\ x} * A_x * C_x * (1-P_{Ret_x})$). Since an estimate is already included in the ER for retention, it is again necessary to subtract the probable impact of retention from the estimate of the value of majoring in a particular subject. This is accomplished by multiplying the choice of major estimate by ($1- P_{Ret_x}$).

Equation 2.2. Expected Net Monetary Value at the Level of the Operating Unit

$$\mathbf{EMV_O = ER_O - DC_O}$$

where

ER_O is defined by Equation 2.1;

DC_O is defined as sum of the direct costs of the program appropriately attributed to the operating unit;

EMV_o = expected net monetary value of a program at the level of the operating unit.

RESULTS

Fifty (50) students of 54 who were enrolled in the LBS program agreed to participate in the current study resulting in a response rate of 93 per cent. Eighty-eight percent of the respondent pool entered the university as a freshman and 60 per cent of the students were female. Thirty-four per cent of the students were aware of the LBS program before matriculating and 88 per cent of these students stated that the availability of the LBS program had an impact on their decision to attend the university. Of those aware of the LBS program prior to matriculation, the probable impact varied from 0 to 80 per cent with an average of 32 per cent. For those aware of the LBS program prior to matriculation, women attributed a 37 per cent average impact due to the program compared to only 21 per cent for the men in the group.

Respondents also cited the program as having an impact on the their decision to remain at the university. For the group that was aware of the LBS program prior to matriculation, 82 per cent of the students stated that the program had an effect on their decision to remain at the university. The impact on retention varied between 0 and 80 per cent yielding an average impact of 41 per cent. For the group that learned about the international program after matriculating, approximately half indicated that the LBS program had an impact on their decision to stay at the university. The impact on retention varied between 0 and 90 per cent yielding an average impact of 24 per cent. When evaluating the program's overall impact on retention (pre- and post-matriculation groups), the program impacted on men's decision to remain at the university slightly more (34 per cent) than that of women (26 per cent).

Fifty-six per cent of the group reported that the international program had an impact on their choice to major in business. The impact of the program to major in business ranged from 0 to 90

per cent with an average impact of 22 per cent. For those aware of the LBS program prior to matriculation, the impact on choice to major in business was 25 per cent and for those who became aware after matriculation the average impact was 21 per cent. There are, however, greater differences when accounting for gender. For the group aware of the LBS program prior to matriculation, the average impact on the student's decision to major in business was 15 per cent for men and 30 per cent for women. For the group that became aware of the LBS program after matriculation, the average impact on the student's decision to major in business was 18 per cent for men and 24 per cent for women. Given that the LBS program is open to all business students, no attempt was made to assess the impact of the program on the student's choice of subspecialties within business.

The overall net tuition revenue (ER) that could be attributed to the LBS program, adjusted for the non-response bias in the sample, was estimated to be approximately $885,000 over the duration of the students' enrolment at the university. Net tuition revenue was calculated by subtracting internally funded scholarships from the published tuition rates for the university. For those students who were aware of the program prior to matriculation, the revenue contribution was estimated to be approximately $526,000 and for those who became aware of the program after matriculation the additional retention benefits equalled $359,000. In other words, the university attracted and retained $526,000 of incremental revenue by virtue of students selecting the university due to the availability of the LBS program and further retained $359,000 of incremental revenue due to students staying at the university after learning about and participating in the LBS program.

At the operating budget level (College of Business), considering only the tuition revenue that could be attributed to the business courses that were taken by students, adjusted for the non-response bias in the sample and internally funded scholarships, the net tuition revenue (ER) impact of the LBS program was estimated to be approximately $299,000. For those students who were aware of the program prior to matriculation, the revenue contribution was estimated to be approximately $123,000 and for those who became aware of the program after matriculation the retention benefits equalled $176,000.

The EMV of the LBS program was provided by Equation 1.2 (for the university at-large) and by Equation 2.2 (for an operating unit within the university). The direct costs for the LBS program were calculated to be approximately $425,000. These costs included such items as housing and program fees for students while they were studying overseas, faculty housing and transportation expenses, group activity funds, teaching and adjunct faculty support and miscellaneous direct administrative support costs. Given the above information, the EMV for the university was equal to $885,000 (total ER) minus $425,000 (total direct costs), or $460,000 net contribution to the university. It is interesting to observe, depending upon how the costs of this program were assigned, the EMV for the College of Business might have been calculated to be $299,000 (ER for the College) minus $425,000 (total direct costs) or a net loss of $126,000. In this particular example, however, there has been a failure within the accounting system to match accurately costs with revenues. Nevertheless, if the operating unit decision maker did not recognise the mismatch, he or she might inadvertently cancel the program and as a consequence harm the financial well-being of the university. This assumed, of course, that the decision maker was only focusing on financial criteria and not other mission related factors.

LIMITATIONS

The method discussed above involves a number of important limitations and considerations. First, the ER and EMV calculations are based only on those students who were selected to participate in the LBS program. Since 88 students initially applied for the LBS program and only 54 were selected, it is possible that this study understates the true economic value of the LBS program.

For example, assuming that the findings of the current study could be generalised to the entire applicant pool, the current results would understate the ER and EMV of the program by an amount equal to the ratio of those students who failed to be accepted divided by the total applicant pool.

Equation 3. Expected Incremental Revenue Generalised to the Total LBS Applicant Pool

$$ER_{TAP} = \frac{ER}{[1 - (B/A)]} = \$885,000/[1-(34/88] = \$885,000/(1-0.39)$$

$$ER_{TAP} = \$1,451,000$$

$$EMV_{TAP} = ER_{TAP} - DC_O = \$1,451,000 - \$425,000 = \$1,026,000$$

where

A = applicant pool;
B = students that applied but were not selected for the program;
ER_{TAP} = expected revenue (monetary) value of the respondent pool;
DC_O is defined as sum of the direct costs of the program (this should be the same as calculated for within Equations 1.2 and 2.2);
EMV_{TAP} = expected revenue (monetary) value of the total applicant pool.

A follow-up analysis of students who applied but were not accepted into the LBS program revealed that 11 per cent of those rejected subsequently dropped out of the university. Eighteen per cent (18%) of those students who were not accepted into the LBS program applied for and subsequently participated in other semester long study abroad programs. In addition, 21 per cent of those students not accepted participated in a short-term (one month) study abroad program. From a managerial perspective, given that many students are determined to study abroad, the relevant questions become (a) whether administrators want to influence the type of programs in which students participate and (b) whether students participate in international programs offered by their current university or whether students seek opportunities elsewhere.

If one were to generalise the LBS program's ER to the total applicant pool (as given by equation 3), the EMV for the university is $1,451,000 minus $425,000 or $1,026,000 net contribution to the University. At the college level, the adjusted ER would be $299,000 divided by (1- 0.39) or a total of $490,000. If total direct costs of $425,000 are then subtracted, the result is a positive monetary value of $74,000 for the college. Even though the college program is now shown to be profitable, the EMV estimate for the college still understates the value of the program to the university as a consequence of the mismatch between costs with revenues.

It is also possible that the estimate of the ER and EMV for the program is further understated to the extent that there are students who decided to attend the university due to their initial interest in the LBS program but later decided not to apply to the program. The estimate also does not consider the word-of-mouth effects that may have accrued as a result of a students' interest in the university due to the international study opportunity.

Three additional limitations or potential criticisms of the current illustration relate to 1) the timing of the data collection, 2) the method used to estimate the probabilities associated with retention, choice of university and the selection of the student's major, and 3) assumptions related to the type of decision making model used by the students, for example, compensatory versus non-compensatory models of choice (Arnould, Price, and Zinkhan, 2004).

With regard to the timing of the data collection, an arguably better point to assess what attributes contributed to a student's choice to attend a particular university would be at the time of matriculation. In this case, it would also be possible to calculate the ER and EMV for a program

for all entering students, at least to the extent of the program's impact on students who are aware of the program prior to matriculation.

The process of estimating probabilities of choice is also fraught with difficulty. The method used in this study employed a single incremental scale that, although relatively straightforward and easy to use, does not provide for any direct measurement of validity. While using multi-trait, multi-method instruments would provide certain advantages, as a working administrative model the tradeoffs between parsimony and complexity must be carefully considered.

Finally, assuming that the choice to attend a particular university is a high involvement decision (Costley, 1988), consumer research would suggest that most students are using some form of compensatory model of choice (Gensch and Javaligi, 1987; Wright, 1976). Although there is evidence (Reilly and Holman, 1977) that consumers will, on occasion, use the non-compensatory choice model, or even a hybrid of the two, for the purpose of estimating the EMV or ER of a program, the compensatory model will yield the most conservative estimates. If a student were using a non-compensatory choice model, she or he might very well eliminate a university from further consideration if the school did not offer an opportunity in which the student was interested, even if the opportunity was relatively unimportant. In other words, the absence of any characteristic of comparative value might be reason to eliminate the school from consideration.

In the current illustration, non-zero probabilities simply reduce the chances of a student attending a particular school but do not eliminate it from further consideration. Although it remains an interesting empirical question as to which choice model students use when selecting a school to attend, the assumption that most students use some form of a compensatory decision rule is supported by the literature.

Additional criticisms of the proposed method for calculating EMV might note that the model fails to consider such intangibles as the learning value of a program or how it contributes to the overall mission of the institution. There may also be interaction effects between programs (a highly valued program may benefit from or even depend upon a less valued program). The current EMV calculation also does not consider issues related to strategic fit. However, the broader methodology of articulating costs and benefits proposed here is believed to be robust enough to accommodate these issues while allowing for the further development of the proposed model. From an incremental perspective, although the information derived from the proposed methodology will result in better decisions, it cannot guarantee perfect choices.

The current paper also focuses attention on the evaluation of existing programs. Future research should incorporate a discussion of how to evaluate new or proposed programs in order to give administrators a more comprehensive budgeting model to use when making resource allocation decisions.

In this paper we have also not included a discussion of sensitivity analysis. It is, however, clear that certain variables within the equation are more sensitive to variation than other factors. As a consequence, sensitivity analysis would be a valuable tool in an overall risk assessment and an area for further development.

SUMMARY AND CONCLUSIONS

The purpose of this study is to illustrate how administrators can develop a measure of the expected incremental revenue and the expected net monetary value for current educational programs. To that end we discuss the opportunities and challenges of conducting such an analysis within a not-for-profit setting. A brief overview of financial tools is provided and an actual case is used to illustrate the process. Although this paper does not specifically address newly proposed programs, much of the basic reasoning developed will also apply to evaluation of new programs.

Equipped with this information, in combination with mission, strategy and related stakeholder constraints, administrators will be better prepared to make difficult resource allocation decisions.

The financial analysis also lends itself to identifying potential marketing opportunities. Consider, for example, the LBS illustration developed within this paper. Given the positive incremental contribution of the LBS program, it would be to the advantage of the institution to promote the program more heavily to potential students, particularly those students who have not yet matriculated to the university. Gender differences suggest that women are attracted to this particular kind of program more than men, which either suggests that effort could be targeted towards those who are already more sensitive to this type of program or, conversely, placing more emphasis on men in order to balance out the applicant pool. Although the LBS program has a positive impact on both men and women's retention, it is noteworthy, especially given that more women are applying to college these days than are men, that the LBS program has a much stronger impact on men's retention rates than that of women.

In conclusion, we want to caution administrators to look at the financial implications of their decisions from both a university and operating perspective. As is illustrated, it is possible that an operating unit might erroneously make a decision to drop or retain a program if there is a mismatch between costs and revenues. Prudent fiscal stewards must consider not only the revenue and cost implications of decisions within their own operating units but also on the organisation as a whole. In the final analysis, professionalism demands that we make well-informed decisions from a community, as opposed to self-interest perspective (Kennedy, 2002).

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