CHAPTER 10

USING PERFORMANCE INDICATORS TO EVALUATE DECENTRALIZED BUDGETING SYSTEMS AND INSTITUTIONAL PERFORMANCE

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In this chapter, we take a closer look at performance indicators and the extent to which they can be useful in assessing decentralized budgeting systems and higher education enterprises. We begin with a comparison of for-profit and nonprofit firms, service organizations, and postsecondary institutions, and highlight the implications that their similarities and differences have for identifying a performance indicator system. Although touted as a way of motivating institutions to become more efficient and improve the learning outcomes of students, the differences between the corporate and higher education models introduce several important limitations to indicators used in higher education. We then review some of the most commonly used performance indicators and their limitations within this framework, and look at a case study of how one university is planning to use indicators to assess the success of its decentralized budgeting system.

USING PERFORMANCE INDICATORS

As described in earlier chapters, decentralized budgeting systems have been adopted in recent years by a number of public institutions, including Indiana

University, the University of Minnesota, and the University of New Hampshire. These systems are often referred to as responsibility centered management (RCM) systems, but the label RCM can represent any decentralized budgeting system where revenues are distributed to academic units in proportion to the revenues that they bring into the institution through their research, teaching, and public service functions.1

To reiterate briefly, units in an RCM system are responsible for using these revenues to cover their total expenditures. Some institutions have switched to RCM in the hope of improving the management of the institution by providing academic units with monetary incentives. Given that the conversion to an RCM system may involve years of planning, and invoke fears among the faculty of adverse consequences for the institution, there is a great need to measure institutional performance and determine if and how it has changed after moving to RCM. This measurement is increasingly being done through the use of institutional performance indicators.

The concept of performance indicators is not new and, in fact, bears a long and storied history.2 In the business world, corporate leaders have relied on performance indicators to evaluate their operations for growth and stability, and identify actions that may enhance their performance. Federal and state governments also use indicators such as the Consumer Price Index, the unemployment rate, and Gross Domestic Product to monitor the performance of the economy. More recently, the concept of performance indicators, along with RCM and other common business practices, have been increasingly applied to higher education. Many colleges and universities now find themselves routinely using statistics such as their graduation rate and expenditures per student to evaluate their performance and justify their value to governing boards, state legislatures, parents, students, and other constituents. This global phenomenon promises to continue as institutions of higher education (IHE) seek to inform constituencies of how their contributions are being spent (Cullen, 1987; Dochy, Segers, and Wijnen, 1990; Findlay, 1990; Cave, Hanney, and Kogan, 1991; Gaither, Nedwek, and Neal, 1994). In addition to evaluating the overall performance of the organization itself, institutions that have adopted RCM budgeting systems also look to indicators to provide evidence of whether the new system has achieved its desired goals.

Advocates of performance indicators often ascribe almost mythical powers to their value for evaluating the performance of higher education institutions. This is perhaps best reflected in the subtitle "Vital Benchmarks and Information to Help You Evaluate and Improve Your Institution's Performance" that accompanies the widely-used book on strategic indicators by Taylor and Massy (1996). Taylor and Massy assert that their set of over 100 indicators "...provides a framework for understanding institutional condition and taking steps to improve competitive position" (p. xv). Performance indicators in higher education have been described by others as "...empirical data...which describe the functioning of an institution, [and] the way the institution pursues its goals" (Dochy, Segers, and Wijnen, 1990, p. 72), "...specific quantifiable measures that tell stakeholders, managers, and other staff whether the college or university is accomplishing its
goals using an acceptable level of resources” (Dolence and Norris, 1994, p. 64), and “...concrete, substantive, measurable, and easily recognized concepts” that should be a more integral part of a university’s strategic planning process than the institution’s mission statement (Rowley 1997, p. 30).

Despite the lofty rhetoric surrounding their value in academe, the indicators most frequently identified by colleges and universities to measure institutional goals – such as retention and graduation rates, expenditures per student, and average freshmen SAT scores – fail far short of this ideal. Borden and Bottrell (1994) argue that to be effective, performance indicators need to be tied to an explicit goal or objective for the institution. Ewell and Jones (1994, p. 23) go further and state “To be useful for policy and decision making, indicators should be developed around sound conceptual frameworks and should encompass multiple aspects of institutional or system performance.” Some IHE (particularly in the two-year sector) have tried to address this issue by engaging in the assessment of valued student outcomes. Much of the research in this area focuses on the effect of incoming characteristics of students on the overall college experience as well as domain-specific freshmen-to-senior changes (see Pascarella and Terenzini, 1991). However, these measures have not been widely incorporated into performance indicator systems, because of the significant time and monetary costs of collecting such information as well as disagreements among analysts as to how to properly measure such gains.

Many IHE are compelled to target certain indicators because particular stakeholders have pressured them to do so, and these stakeholders may have different political motives and conflicting opinions about the relative importance of different indicators. This is perhaps most evident with the college rankings published annually by U.S. News and World Report (USNWR). Although many educators question the rankings on the grounds that they are not directly related to institutional goals and quality, they acknowledge that the USNWR rankings receive significant publicity and may influence student decisions regarding where to go for their postsecondary education (Patterson, 2000; Thompson, 2000). Accordingly, administrators pay very close attention to their rankings, and may try to identify policies that would result in higher rankings.

In this chapter, we examine the potential use of performance indicators as evaluation tools for responsibility-centered management systems and the extent to which they can function more broadly as valid assessments of institutional performance. We begin by reviewing the historic use of performance indicators in the business and corporate world and comparing the goals and objectives of for-profit firms and nonprofit enterprises with higher education institutions in general. Next, we highlight the implications that their similarities and differences have for identifying performance indicators to assess these goals. We will argue that performance indicator systems are most effective when the goals of the organization are well defined and measurable, and the organization has an understanding of how to use various policy levers at its disposal to reach these goals. While touted as a way of motivating institutions to become more efficient and improve the learning outcomes of students, performance indicator systems have proven to be less effective in a higher education setting for two reasons:
1) There are problems associated with identifying and measuring the ultimate goals/outcomes of colleges and universities because of the multi-product nature of IHE (see Kerr, 1982); and 2) IHE have limited control over the inputs and production processes that might be used to attain these goals. These limitations arise from a failure to take into account how the differences between for-profit firms and colleges/universities might affect the types of indicators that would be appropriate for a higher education setting.

We then review some of the most commonly-used performance indicators and their limitations within this framework, and show that the indicators most often selected by institutions are at best very rough measures of institutional goals, and can in fact be far removed from the actual objectives of the organization. Furthermore, we will discuss the problems associated with setting targets for such indicators and attempting to implement policies to achieve these targets.

Finally, we focus directly on the goals of RCM systems and critique the validity and adaptability of performance indicators as part of the evaluative process of these goals. We will argue that because institutional goals and objectives are extremely difficult to quantify, it cannot be determined through performance indicators whether an RCM system has affected the institution's pursuit of these goals. Institutions with RCM systems often list other goals that are related to their incentive structures, such as to raise enrollment levels, increase sponsored-research dollars received, and limit the growth of per-student expenditures. The fact that these outcomes are affected by a range of other internal and external factors that are also changing over time will make it nearly impossible to attribute any change as a result of RCM. Additionally, the incentives that are typically incorporated into an RCM system may have negative consequences on the institution's ability to meet goals that are not rewarded by the budgeting system. The more process-oriented goals of RCM, such as clarifying the budgeting process, are also difficult to measure with quantitative data or indicators, but can be examined through more qualitative methods such as interviews and surveys of faculty and staff.

ORGANIZATIONAL GOALS, OBJECTIVES, AND PERFORMANCE

Over time, for-profit firms, nonprofit entities, and for-profit service organizations have looked to indicators as a way of assessing the relative performance of their operations. In a different context, indicators have been used by economists and policy analysts to evaluate the health and performance of the economy. The potential contributions that performance indicators can make in each context, however, are centrally related to the goals and objectives of the organization/entity to which the indicators are applied. It is useful to begin by reviewing the traditional "production function" model as it is used in the
corporate for-profit world and then see how this model can be applied to IHE\textsuperscript{3} (see Winston, 1997).

The production function can be thought of as consisting of four separate components: inputs, production process, outputs, and goals. This is similar to the “Input-Process-Output” model (Cave, Hanney, and Kogan, 1991; Borden and Bottrill, 1994) and the “Input-Environment-Outcomes” model by Astin (1993) that have been used to describe higher education. We add goals as a separate category at the end of the process to highlight the fact that outputs, such as the number of students taught and the number of publications produced, can be quite different from the outcomes of education (e.g., knowledge production, cognitive gains of students). In its simplest form, these models describe how an organization can use its production processes to convert inputs into outputs for the purpose of meeting specific goals. The inputs for firms consist of the raw materials ultimately converted into outputs and the factors of production such as land, labor, and capital (e.g., machinery or technology) used for the conversion. The ways in which the levels of land, labor, and capital are combined to produce outputs from inputs constitute the production process. Output for the firm consists of the levels of goods and services produced. Despite the obvious oversimplification of the input-production-output model, it is useful for understanding the operations of most any type of organization (Middaugh, 1990; Cave, Hanney, and Kogan, 1991).

Goals of For-Profit Entities

As their name implies, the goal of for-profit firms is to maximize profits. The traditional textbook treatment of the firm posits that firms choose the level of output at which profits are maximized. Note that the firm is not attempting to maximize the level of output produced, but rather output is a means for achieving the goal of higher profits. In the corporate world, indicators of cost efficiency are very important, and follow from the relationship between the firm’s goals of controlling costs and maximizing profits. In this model, the firm’s success in reaching its goal is measured by the level of profits, and these four components – inputs, production process, outputs, and goals – are fairly well-defined and are measurable, making it possible for management to examine how changes in the production process affect the firm’s success in attaining its desired goal of the organization, and to implement changes in the inputs and production process to increase profits.

Goals of Nonprofit and For-Profit Service Entities

In contrast, the goals and objectives of nonprofit (e.g., churches, philanthropic organizations) and service organizations (e.g., hospitals) are often more difficult to define and measure. Churches may be more interested in increasing the spiritual development of their congregations than maximizing
profits, and because this objective is difficult to define and measure, churches cannot easily determine how effective they are at meeting this goal. Although some service organizations may share the profit maximization goal with their corporate counterparts, they may also have other objectives that are difficult to quantify. For example, it can be argued that medical professionals share the profit-maximizing goal with other for-profit entities, however they also seek to raise the overall health level of the patients they treat.

Even though the goals for these entities are not always well-defined, the organizations can still be described as having a parallel to the manufacturing model in that they use inputs and a production process to help attain their goals. In these instances, it is difficult for the organization to quantify the true benefits that can be attributed to specific changes in the production function. The lack of quantifiable information about organizational goals makes it very difficult to evaluate whether specific changes could be implemented to better attain the goals.

HIGHER EDUCATION GOALS, OBJECTIVES, AND INDICATORS

When the above framework is applied to colleges and universities to determine whether performance indicators can be used to understand and improve their operations, how do IHE compare to for-profit and nonprofit entities? Given that they are primarily engaged in providing services and most are nonprofit in nature, IHE share many of the characteristics of nonprofit and service entities. Nonetheless, there are also some similarities between IHE and for-profit firms that have in part led the initiative to apply business practices to academe. Colleges and universities can be described in terms of an educational production function with its four categories. The primary raw materials/inputs for higher education institutions are its students and faculty, and institutions employ faculty and other staff, machinery, technology, and land to produce outputs in the areas of teaching, research, and public service. The production process for higher education describes how campuses (land), students, faculty, and staff (labor), teaching materials and technology (capital) are combined and distributed to produce educational outputs. Having access to more financial resources should enable institutions to purchase more and better factors of production and/or improve their production processes, and as a result produce more and better output from their available raw materials/inputs. Thus, in theory, there should be ways in which IHE can alter both the inputs and production process to better achieve their goals and objectives.

Goals for Institutions of Higher Education

Although the production function analogy can be applied to higher education, the consensus among higher education researchers is that decisions in
most colleges and universities are not driven by the goal of profit maximization. Public institutions by definition are nonprofit in nature, and the fact that highly selective private institutions set prices below their market-clearing levels suggests that even private institutions do not behave as profit maximizers.

Whereas the goals for colleges and universities seem to have more parallels with nonprofit and service organizations than with for-profit entities, analysts disagree as to what these goals might be. Bowen (1980), for example, argued that institutions attempt to maximize their prestige rather than their profits, and according to Brinkman (1990), institutions neither attempt to minimize or maximize costs. In contrast, Paulsen (2001) suggests that colleges and universities operate in a monopolistically competitive market and attempt to maximize their discretionary budget (also see Paulsen and Smart, 2001). Many IHE describe their goals and objectives in ambiguous terms such as: “Our institution is committed to excellence in education and to supporting the best in scholarship and research while also contributing to economic opportunity in the state,” which offers little guidance to those charged with determining if these goals are being met.

However, academics and analysts alike have not been much more successful in devising meaningful measures of institutional goals and objectives, and the goals that they have offered have changed very little over time. Over a century ago, John Stuart Mill (1895) offered three broad categories of educational outcomes: (a) benefits of higher education students receive while pursuing their education; (b) nonfinancial benefits accrued to students following their graduation; and (c) future financial returns for students from their education. The California and Western Conference Study (also known as the “Council of Ten Study”) argued that colleges and universities produce educated students, and that the learning environment is not the final product but rather a means to produce educated students (Middlebrook, 1955). Harry Hirsch (1965) viewed the learning environment as the nature of a university, and intellectual growth as the product produced by colleges and universities. Public institutions are also obligated to meet other goals, such as providing access to higher education for traditionally disadvantaged students, and serve the specific needs of their states. Further complicating matters is the interrelationship between these activities and the production function, in that the production of research will affect the quantity and quality of teaching produced and vice-versa. The situation with regard to goals in academia is perhaps best summarized by Cohn, Rhine, and Santos (1989), who argue that higher education institutions seek to achieve a multiplicity of goals simultaneously, and that these goals often conflict and are very difficult to define and measure.

In the broadest sense, the goal of a university is to make contributions to society through research, teaching, and service activities. The mission of each institution describes the relative emphasis given to these three areas. However, problems arise when attempting to go beyond a general statement of goals and specify the precise desired outcomes for an institution. On the research side, for example, how should the contributions to society made through faculty research efforts be evaluated? Output measures such as the number of publications in
peer-reviewed journals say little about whether such research necessarily has an impact on the advancement of knowledge. It is equally difficult to define outcomes from teaching and public service activities. The graduation rate of an institution, for example, says little about the quality of education that students receive.

Even when a generally agreed-upon goal for IHE is identified, it often proves difficult to quantify. To illustrate, almost every college and university administrator would say that one of their primary goals is to help students learn. Although there is a growing literature on how students gain from their experiences in higher education (e.g., Astin, 1968; Pascarella, Terenzini, and Hibel, 1978; Banta, Lambert, Pike, Schmidthammer, and Schneider, 1987; Pike, 1992; Kuh, Pace, and Vesper, 1997; Toutkoushian and Smart, 2001), a consensus on how to identify and measure student gains has been elusive. There are a number of ways in which students can benefit from college, including cognitive gains, knowledge and academic skills acquisition, creative development, social/personal development, social awareness/tolerance, job skills competencies, and economic advancement (Lenning, Vanderwell, and Brue, 1975; Terenzini, Theophilides, and Lorang, 1984; Pace, 1990; Pascarella and Terenzini, 1991; Kuh, Pace, and Vesper, 1997). Within each of these areas, there exist multiple measures of the underlying goal. Some analysts advocate using the earnings of graduates as a measure of student gains (Solmon and Wachtel, 1975; Wachtel, 1976; James, Alsalam, Conaty, and To, 1989), but others favor using student test scores and grades (Astin, 1968; Rock, Centra, and Linn, 1970; Rock, Baird, and Linn, 1972; Pascarella and Terenzini, 1978; Pascarella, Terenzini, and Hibel, 1978; Pike, 1992). Finally, a number of researchers have turned to self-reported gains based on student reflection as a means of measuring the benefits from higher education that are more difficult to quantify, such as interpersonal skills and tolerance/awareness (Nichols, 1967; Terenzini, Theophilides, and Lorang, 1984; Kuh, Pace, and Vesper, 1997). These unresolved issues, together with the substantial costs of collecting data on student gains, keep institutions from incorporating them into their performance indicator systems.

Goals for RCM

IHE that adopt RCM use a decentralized approach to budgeting where revenues and expenditures are allocated among units (responsibility centers) using formulas defined by the institution. Whereas the specific formulas vary widely across institutions, revenue allocations are usually heavily influenced by each unit’s enrollment level and sponsored research funding received, because these two activities bring revenues into the institution. The switch to an RCM system is not a change in the IHE’s production process per se, but the manner in which revenues and expenditures are assigned to units may lead to changes in the production process through the incentives that they give to increase revenues and decrease costs. For example, if a unit knows that its revenues are proportional to
its enrollments, then it might want to implement changes in how its faculty members teach students in an effort to increase enrollments.

Institutions with some form of RCM system define two sets of goals for the system. The first set of goals relates to the process/functioning of the institution's budgeting process. These goals might include items such as streamlining financial reports, clarifying the budgeting process, and increasing participation by units in the budgeting process. Many of the goals in this area are difficult to quantify through standard metrics, however, because they are based on the perceptions of faculty, staff, and administrators, but could be evaluated through qualitative means. The second set of goals relates to the impacts of RCM on institutional goals. At a minimum, administrators hope that the changes in the budgeting system will not come at the expense of the institution's ability to achieve its overall goals in teaching, research, and public service. Some advocates go further and argue that the incentive structure in RCM can help the institution to better achieve its goals and objectives. Even if the system is successful in helping the institution achieve its goals, however, the problems associated with measuring institutional goals mean that it is difficult to identify indicators that could be used to determine if this is true. IHE that attempt to make this assessment are often forced to rely on the same types of metrics that are typically included in institutional performance indicators (e.g., graduation rates, average SAT scores of students, expenditures per student), and, as such, are subject to the same limitations.

**Inputs and Production Processes in IHE**

A second distinguishing characteristic of the production function model as applied to IHE is that there is a unique relationship between the inputs and production process. The main inputs in higher education—faculty and students—are also an extensive, interactive segment of the production process. Faculty members use their time and talents to produce outputs in research and public service, and, as labor, are part of the production process used to produce instructional outputs from teaching students. Learning is not a passive or automatic process, therefore students are also factors of production in that their academic effort is required to convert *themselves* into instructional output and outcomes. This "cross functionality," where the input resources also serve as critical factors in production, is an important and relatively unique characteristic of the higher education enterprise. The consumer is both part of the production process and influences the quality of the final product. This means that having a specific mix of inputs and production processes in place will not guarantee that the desired outcomes will be achieved. This is perhaps most true in the area of student learning.

In a related process, colleges and universities do not have complete discretion over what inputs they will use to try and reach their goals. Rather than the firm selecting all raw materials, as in much of the for-profit world, in the higher education setting the raw materials (students) select the firm (college or
university). Although colleges can exercise some choice of which students to enroll through the admission process, the pool of applicants ultimately restricts the final set of student inputs used. Potential students have a demand function describing their willingness and ability to attend a particular institution, with this demand being influenced by factors such as their income level and the expected benefits and costs from attending each institution. In this regard, there are parallels between IHE and service industries, where patients select which doctor or hospital to visit for treatment and they have some influence over the success of any treatment. Colleges and universities are also constrained in their ability to choose other factors used in the production process. On the faculty side, the tenure system reduces an institution's flexibility to readily alter the inputs used in the production process in response to changes in demand or to meet different goals and objectives. Likewise, the decentralization of authority to faculty on decisions of how to teach and conduct research limits the extent to which administrators may implement specific policies to attain their goals when they differ from the goals of the faculty.

These two problems — lack of control over the production function and insufficient measures of goals/outcomes — place important limitations on the success of performance indicator systems in identifying strategies that postsecondary institutions can implement to reach their goals and objectives. A consequence of these problems is that while IHE do have influence over some inputs and aspects of the production process (such as expenditures and acceptance rates of students), without clear measures of institutional goals, administrators do not know how to change these "policy levers" to help the institution meet its desired goals. A college or university will likely never be able to reliably estimate the degree to which using better computer technology in the classroom contributes to student learning or their future job prospects. Institutions would like to know, for example, if it is best to put additional money into student services, faculty salaries, campus facilities, athletic programs, or other uses. Without good measures of institutional goals and outcomes, such questions are difficult to answer for those policy levers at their disposal.

The presence of multiple goals also introduces the possibility that changes in inputs and/or the production process may help the institution achieve certain goals and hinder its progress towards other goals. Lowering the acceptance rate (increasing the selectivity) at an institution may improve the academic profile of an entering class of students and hence the reputation of the institution, but it could also mean reduced educational opportunities for disadvantaged students and increasing expenditures per student if enrollments fall as a result. Likewise, policies that would raise the minimum time commitment for faculty in the classroom may lead to gains in student learning, but may also have negative consequences for faculty research and public service contributions. This last example is particularly relevant for institutions with RCM systems because the revenue allocation formulas tend to provide incentives to engage in activities that generate revenues for the institution, most notably teaching and sponsored research. The presence of resource constraints (e.g., time, number of faculty) means that units may choose to divert resources away from activities that do not
generate revenues in order to respond to the incentives to increase enrollments and sponsored-research dollars. Therefore, activities such as general public service, nonsponsored research, participation in institutional, collegiate, and departmental committees, and other nonrevenue generating activities might suffer as a result of the RCM incentive structure. Some of these activities, such as nonsponsored research, are highly concentrated in particular academic disciplines. If there are valued institutional outcomes associated with these activities, then it is possible that RCM may ultimately lead to changes in the mission of the institution. This is a plausible example of how goals/values of RCM systems can conflict with and unwittingly take precedence over institutional goals/values. Institutions with RCM budgeting systems need to be aware of these possible adverse effects and have a governance structure in place to ensure that highly valued, but nonrevenue generating, activities are still supported by the institution.

The Ceteris Paribus Assumption

Even when goals are measurable and the organization has policy levers at its disposal, it may be difficult to isolate the effects of a single policy on these goals. In many instances, there are multiple factors that are changing at the same time that affect the organization's goals. The temptation among decisionmakers who observe a simultaneous change in an outcome and input is to then attribute the change in the outcome to the input. However, this inference requires the assumption of ceteris paribus, (that all else is held constant) and when this is not true, incorrect conclusions can be drawn about the effects of the policy on organizational goals. This most certainly applies to higher education, where demographic, social, political, and economic factors are often changing at the same time, which results in a combined impact on IHE. When goals are measurable and data exist on relevant input and process factors, multivariate statistical techniques can be used to estimate the effects of each factor holding the others constant. Where the outcomes are not clearly defined and measurable, however, statistical methods have limited value for this purpose.

Administrators seeking to evaluate the impact of RCM on an institution need to recognize the limitations that the ceteris paribus issue imposes on them when using performance indicators. Advocates for RCM will be tempted to attribute positive changes in indicators to the implementation of RCM, and opponents of RCM will tend to blame the new budgeting system for any negative changes in indicators. For example, if sponsored-research funding were to rise following the adoption of RCM, advocates might argue that the system's incentive structure has led to this outcome. Likewise, if enrollments within a unit were to decline following the implementation of the RCM system, critics might conclude that this is proof that the system is not working. In each instance, it needs to be recognized that the indicators in question are also affected by constantly changing internal and external forces, many of which are beyond the control of the institution.
COMMONLY USED PERFORMANCE INDICATORS

Most analysts accept the production framework for classifying performance indicators, but there is little agreement when it comes to determining what specific measures should be used for assessing IHE. In their review of performance indicator systems, Borden and Bottrill (1994) compiled a list of 268 different indicators that have been used by various colleges and universities. Some recommend that colleges and universities should use long lists of indicators that encompass a range of financial and enrollment data (Middaugh, 1990; Taylor and Massy, 1996), while others argue that to be useful to policymakers, the set of indicators must be relatively small (Ewell, 1994; Gaither, 1997; Layzell, 1999). Most of the indicators in use tend to rely on pre-existing data at the institution rather than require new data collection efforts.

Analysts’ opinions differ not only on the size and scope of performance indicator systems, but also with regard to what are the most essential indicators for an institution to monitor. For example, of the “top 10 indicators” that Taylor and Massy (1996) describe as being especially important for institutions, only one of these is also considered to be among the “core indicators” identified in a 10-state project conducted by the Education Commission of the States (Ewell, 1994). In part, these differences reflect the emphases that states and financial administrators give to different educational outcomes, because state legislatures are generally more interested in the number of residents who receive an education from a particular institution, and campus administrators may focus more on the financial health of the institution. Nonetheless, the variations in what experts consider to be the best measures of performance highlight the fact that academe has not agreed on what indicators best reflect performance. Some of the most commonly used performance indicators in higher education and how they might be classified according to the production function model are listed in Table 10.1.

Most of the indicators listed here suffer from the limitations described in the previous section. Beginning with outcomes, measures such as the reputational ranking of the institution, and student satisfaction have not been shown to be measures of, or even correlated with, the true outcomes or goals of the institution. Likewise, output measures such as the number of degrees awarded may or may not be directly related to the ultimate goals of the institution. These lists also rarely include specific measures of student gains. This gap was highlighted in the National Center for Public Policy and Higher Education’s (2000) report Measuring Up 2000, in which all states were given a grade of “incomplete” in the area of student learning.

The goal of advancement of knowledge through research is especially underrepresented among the sets of indicators that are used in higher education. Faculty publication counts are more correctly viewed as output measures than outcomes, and are difficult to obtain because this information is not often collected centrally at a college or university. Policies aimed at raising faculty publication counts may have adverse effects on the quality of research if these in-
Table 10.1: Commonly Used Performance Indicators in Higher Education

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<thead>
<tr>
<th>Category</th>
<th>Common Performance Indicators</th>
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<tbody>
<tr>
<td>Input</td>
<td>Student headcounts&lt;br&gt;Percentage from underrepresented race/ethnic group&lt;br&gt;Average SAT/ACT scores of freshmen&lt;br&gt;High school GPA or class rank of freshmen&lt;br&gt;Percentage of applicants who are admitted&lt;br&gt;Percentage of admitted students who enroll&lt;br&gt;Average faculty salaries</td>
</tr>
<tr>
<td>Production Process</td>
<td>Expenditures per student&lt;br&gt;Student-to-faculty ratio&lt;br&gt;Credit hours per faculty member&lt;br&gt;Percentage of courses/students taught by tenure-track faculty&lt;br&gt;Expenditures per student by major category&lt;br&gt;Revenues per student by major category&lt;br&gt;Level of deferred maintenance</td>
</tr>
<tr>
<td>Output</td>
<td>Number of faculty publications&lt;br&gt;Number of degrees awarded</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Reputational rankings (e.g., USNEWS)&lt;br&gt;Percentage of alumni who have donated to the institution&lt;br&gt;Retention rates (two-, three-, and/or four-year)&lt;br&gt;Graduation rates (four-, five-, and/or six-year)&lt;br&gt;Average time to degree&lt;br&gt;Research grant dollars received&lt;br&gt;Student satisfaction (from surveys)</td>
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Incentives lead faculty to choose research projects based more on prospects for publication rather than on their potential for knowledge advancement. The most commonly used research performance indicator is based on dollars of sponsored research at an institution, because this information is readily available to administrators. However, there is no evidence that the level of sponsored-research dollars is correlated with the quality of research produced. More importantly, these measures tend to neglect nonsponsored research, which is central to many disciplines in the social sciences, arts, and humanities.

The lack of institutional outcome measures, and the need in academe to continue to evaluate institutional performance, has led many institutions to monitor available metrics such as graduation/retention rates, expenditures per student, and the average qualifications of incoming students. Even though IHEs may target such variables, they are not the true goals of the organization, and it is not known whether or how they are tied to the ultimate (unobservable) goals. For example, if the average SAT scores of incoming freshmen increase at an institution, does this mean that the institution is doing better helping students to learn? Likewise, although time to degree is a commonly used performance indicator in higher education, and there is a sense among decisionmakers that the
time to degree should not be "too long," it is not clear how the average time to degree influences an institution's success in reaching its goals and objectives.

The reward structure in an RCM system may, if left unchecked, lead to behaviors that have a detrimental effect on institutional goals. For example, suppose that the RCM system makes each unit responsible for covering its expenditures, and in response, units implement changes to reduce costs per student; the hope is that the system would provide incentives for units to become more efficient, but the cuts may in fact hinder the institution's ability to meet its ultimate goals and objectives depending on how they are made. Personnel costs for instruction are the largest cost component in institutions of higher education, so departments may resort to using more nonregular faculty (e.g., adjunct faculty, lecturers, and graduate students) for instruction. Such a policy could lead to concerns that the quality of educational services provided to students will diminish as a result. Colleges often find themselves in a conundrum of sorts since the college rankings produced by USNWR reward colleges and universities for having higher per-student expenditures, on the premise that they can then provide better services to students, while legislators, trustees, and RCM formulas pressure institutions to contain or even reduce costs.

These examples highlight the fact that when indicators are not clearly tied to the true goals and objectives, the institution may implement ineffective policies that can potentially lower effectiveness by suggesting misdirected incentives. Furthermore, the constraints under which the organization operates have to be taken into account when evaluating particular indicators. Performance indicators based on the quality of graduates, for example, would penalize institutions that view providing access to higher education for marginal students as an important institutional goal. This indicator may not capture academic growth and development of such students because it does not take into account their incoming characteristics and potential for gain. Careful thought needs to be given to any incentives that might be created for faculty, departments, and institutions by the use of any set of performance indicators.

PERFORMANCE INDICATORS AND RCM: A CASE STUDY

The above discussion highlights many of the difficulties faced in assessing the success or failure of specific institutional programs such as RCM through the use of performance indicators. When IHE cannot measure the outcomes that they produce from their efforts, they cannot easily determine whether a change in budgeting systems has had an impact on the attainment of these goals. As a result, institutions often point to available metrics such as their graduation rates and average SAT scores of students as measures of their institution's academic quality. Here, however, the ceteris paribus problem becomes especially important, because these indicators could be changing or not changing due to many different factors. Other process-related goals associated with RCM cannot be readily measured by performance indicators, and would require qualitative
information from faculty, staff, and administrators who have worked with the old and new processes.

The experiences of the University of New Hampshire (UNH) help to illustrate the type of goals and objectives that are often associated with RCM systems, and the challenges involved in defining performance indicators to evaluate the system. The development of the revenue and expense attribution formulas in the RCM system at UNH began in 1997 with the creation of a steering committee. On July 1, 2000, the university officially switched to an RCM budgeting system. The revenue formulas distribute tuition revenues to the responsibility centers in relation to their enrollment/credit hour levels, sponsored-research dollars (indirect cost recovery) are allocated based on the dollars brought into the university by the unit, and state appropriations are distributed on the basis of faculty salary levels and “balancing adjustments” to hold units financially harmless at the point of transition to RCM. Likewise, direct and indirect expenses are assigned to each responsibility center based on their level of employee compensation, space utilization, and revenues.

The Operating Manual prepared by the steering committee for the UNH community describes the following goals of the RCM system: 1) decentralize financial authority and accountability; 2) simplify budget procedures; 3) improve budget forecasting and planning; 4) increase central administration focus on strategic matters; 5) improve institutional flexibility to match resources with program demands; 6) clarify financial reports to the university community; 7) improve management of budget surpluses; and 8) increase incentives for revenue generation. Of these eight goals, all except goals (5) and (8) can be described as process-related because they pertain to operational aspects of budgeting, financial management and reporting. Performance indicators would not be very useful for evaluating these goals that do not readily lend themselves to quantification. The university must rely on interviews with administrators and others in the campus community to help examine these goals.

The fund balances accumulated within responsibility centers can be used as one measure of goal (5), with the presumption that larger fund balances lead to greater flexibility. Growing fund balances, however, do not guarantee greater flexibility at the unit level, which depends on the ease at which the unit was able to secure additional funding from the central administration under the old budgeting system. The goal of increasing the incentives for revenue generating activities (8) was met once the RCM system was fully implemented, and thus no assessment is needed for the goal as written. What is not known is whether these incentives have led to the desired changes in behavior by academic units at UNH. Whereas indicators can be created based on revenues generated by source, these revenues may change within specific units for any of a number of reasons, only one of which may be the switch to an RCM budgeting system.

In addition to the stated goals of the RCM system, UNH also hopes that the new budgeting system will help the university to better meet its overall goals and objectives, or at a minimum, will not have a detrimental effect on these goals. The steering committee’s description of the limitations of the old budgeting system it notes that: “The old system did not recognize academic quality since
quality was not explicitly measured or rewarded with few exceptions (tenure, merit increases, and promotion)." The steering committee has stipulated that a formal review of the university's RCM system will be conducted after five years. They note: "Criteria used to evaluate RCM will include, but not be limited to, trends in academic quality, student quality, institutional financial health, and faculty and staff morale." Under the Quantitative Academic Quality Review, the steering committee has identified the following indicators:

Statistical data and other appropriate data will be analyzed to determine what effect the budget system has had on the University's teaching, research, and service missions. Some of the statistical data to be reviewed are class size, grades (grade inflation), tenure track faculty to non-tenure track faculty ratios, admission data (SAT, class rank, etc.), faculty/student ratios, graduation rate, freshman retention, and student satisfaction.

Similarly, the indicators in the area of Research and Scholarly Activity Review are described as follows:

This component of the RCM review will examine effects that RCM has had on our research and scholarly activity. This review will have two components. One component will be a review of our external research activity based on revenue, mix of research activity by college, mix of funding sources, and number of proposals. The second component is more subjective and will deal with the level of scholarly activity and unfunded research occurring within the faculty. A sense of this will be gathered by reviewing the faculty annual reports and through discussions with Deans and faculty in the general interviews.

Several interesting observations can be made from these two statements. First, they highlight the need to examine the effects of the RCM system on the institution's overall goals in teaching and research. Second, the indicators listed under the heading Quantitative Academic Quality Review are not direct measures of teaching outcomes and thus do not measure academic quality. Similarly, revenues from externally funded research and the number of proposals are not outcomes produced by the university from their research activities. The RCM indicators are thus subject to the same limitations as those usually chosen by institutions to assess their overall performance. Notably absent from either list are indicators relating to the public service mission of the university.

A third observation worth noting is that, putting aside the meaning of these particular indicators, all of them can be affected by a number of factors in addition to the budgeting system. The *ceteris paribus* issue will make it very difficult for the university to determine if RCM has contributed to changes in these indicators. For example, suppose that UNH observes that the graduation rate declines in the years following the adoption of RCM. Without information on all of the other factors that might have also affected graduation rates, as well as an analysis of their impact, the university will not be able to determine if RCM also contributed to the decline. Because the same caveats would apply to the other indicators listed in this section, it is questionable whether the data will be useful for examining the impact of RCM on even these measures. The university
recognizes the importance of this issue when the steering committee warned: "It should be noted that a major challenge in this review will be to determine the extent to which any positive or negative trends have a causal or coincidental relationship to RCM." UNH further cautions the university community that: "Trends will not automatically be attributed to RCM."

DISCUSSION

In this chapter, we have provided a rather critical appraisal of whether indicators can be used to evaluate the performance of institutions of higher education and popular initiatives such as RCM. Our review of the performance indicators most frequently used today in higher education shows that while such measures may provide useful information to decisionmakers, to view them as measures of whether an institution is achieving its various goals and objectives from teaching, research, and public service would be very misleading. The discussion highlighted two main reasons why the performance indicator model is more difficult to apply to higher education than it is in the corporate world, and why institutions have struggled in their attempt to define meaningful performance indicators. Without clear measures of institutional outcomes and control over many important factors of production, institutions will have difficulty defining policies based on indicators that will lead to true improvements in their performance.

These limitations, together with the ceteris paribus issue, are especially important for institutions with responsibility-centered management budgeting systems to consider when they attempt to define indicators to assess the strengths and weaknesses of the system. These concerns with performance indicators are not meant to imply that RCM budgeting systems are therefore ineffective or detrimental to institutions. It could be true that in many instances, the improvements in budgeting processes that accompany an RCM system are beneficial to institutions, and that the incentive structure induces the type of behavior among units and faculty that are desired. We argue here, however, that regardless of the true utility of an RCM budgeting system, it is very difficult to identify a set of performance indicators that would be appropriate for evaluating the goals associated with the system.

These reasons may be sufficient for some institutions to conclude that the benefits of performance indicator systems in higher education are outweighed by the costs of defining, collecting, and using them for decisionmaking. Other institutions, particularly in the public sector, will still be obligated to implement a performance indicator model in response to pressures from stakeholders to demonstrate that they are providing benefits to society and are using funds wisely. Because of this pressure, colleges and universities are likely to continue collecting information on indicators that are readily available from existing databases, such as graduation rates, average time to degree, and expenditures per student, and
establishing targets for them even if they privately question whether such indicators say anything about performance.

Given that the internal and external need to evaluate institutional performance will not go away in the immediate future, how should institutions proceed? First, we need to acknowledge the limitations of most current indicators as measures of performance for IHE, and temper expectations of what can be learned from such measures. The term “performance indicator” implies that the measure being examined is in fact related to an institution’s ultimate goals and outcomes, which may or may not be true. Trends in various input, process, and output measures and other statistics, and comparisons of these measures to other institutions, will be helpful to decisionmakers as they try to assess the health of their institution. Unfortunately, it may take years to observe a trend and institutions may not recognize the trend until it is too late. The danger arises when decisionmakers place too much faith in certain measures as indicators of their desired outcomes, and arbitrarily set targets for these measures. As a whole, commonly used indicators can provide information on a variety of aspects of the institution, but offer little constructive guidance as to what specific policies should be implemented to improve institutional performance in terms of achieving the institution’s desired goals and objectives. These limitations need to be understood and explained – perhaps repeatedly – to various stakeholders who might have less knowledge about the goals of higher education and, as a result, set unrealistic expectations about the value of applying performance indicator systems to IHE. The most basic purpose of performance indicators is to force institutions to think about how they might improve what they are doing.

Decisionmakers also need to be aware that when they use measures such as graduation rates and reputation scores as institutional targets, these measures can be influenced by a wide range of factors, many of which are difficult for the institution to control and may be changing simultaneously. Other policies that may lead to improvements in some goals could in turn make it more difficult for the institution to achieve other goals. In light of these concerns, performance indicators have some value as supporting information for decisionmaking, especially for measuring financial goals, but not as strict measures of performance. They should be part of the set of information considered by administrators and not a source of easy answers.

Work should continue on developing a better framework for identifying indicators that could be useful for decisionmaking. A number of authors have offered criteria that performance indicators in higher education should satisfy. The National Center for Education Management, for example, suggests that good indicators have policy leverage, are not susceptible to manipulation, are easily understood by lay audiences, embody the interests of multiple constituents, have appropriate benchmarks, are statistically valid, and can be attained at a reasonable cost (Ewell and Jones, 1994). Interestingly, these criteria focus more on the process of measuring of indicators, and on the ability to convey them to various stakeholders, rather than how well the indicators actually measure the desired outcomes of the institution. Likewise, while Banta and Borden (1994, p. 96) argue that “performance indicators should have a clear purpose, be coordinated
throughout an organization or system, extend across the entire range of organizational processes, be derived from a variety of coordinated methods, and be used to inform decision making," they also note that of the performance indicator systems they have reviewed, few meet all of these criteria.

At present, it is difficult to see how such a performance indicator system can be devised for IHE. For any set of indicators to yield insight into institutional effectiveness, better measures of "performance" need to be developed that attempt to reflect whether or not an institution is meeting its goals and objectives. Because institutions pursue multiple goals and the outcomes are not easily measurable, it must be acknowledged that any set of measurable outcomes will be incomplete and subject to criticism. However, beginning the process with measures of desired outcomes would be helpful not only for developing policies to improve those outcomes, but also for framing the discussion with internal and external constituencies about the benefits provided by higher education to society and the choices and limitations that they face in achieving these goals. This approach will prove to be more costly, in terms of data collection and time, than one of reporting indicators that are readily available and used by other institutions. However, if the objective behind a performance indicator initiative is to design policies to improve performance, then the definition and measurement of outcomes relating to the goals and objectives of the institution is a necessary first step. The combination of traditional, quantitative measures (often "output" in nature) with more qualitative, outcome-related measures will lead to a more comprehensive, strategic assessment of an institution calibrated to its specific mission.

NOTES

1. Other public colleges and universities that have adopted variations of RCM budgeting systems include the University of California at Los Angeles, the University of Illinois, Purdue University, the University of Oregon, Central Michigan University, and the University of Iowa.

2. Borden and Bottrill (1994) provide an excellent summary of the historical development of performance indicators in higher education. They note that the trend towards evaluating the activities of postsecondary institutions can actually be traced back to the reputational studies that became popular with the work of the American Council on Education (Roose and Anderson, 1970) and the Gourman report (Gourman, 1996).

3. This chapter looks at higher education through an economic or "structural lens"; other lenses through which higher education organizations can be viewed include human resource, political, and symbolic. Moreover, alternative models of how IHE work are numerous (see Peterson, 1986).

4. Professional staff also can be viewed as raw materials to the extent that they produce outputs of value to the institution (such as research), in addition to serving as part of the production process converting faculty and students into outputs.

5. For a review of other early models and theories of higher education, see Witmer (1972).

6. It is not clear whether research and teaching should be viewed as substitute or complementary activities. On the one hand, the fixed time constraint for faculty suggests
that increasing time spent on teaching will decrease time spent on research and ultimately research output. Conversely, it may be argued that research increases the quality of instruction and vice-versa. Empirical evidence, however, suggests that spending more time on teaching decreases research productivity (see Bellas and Toutkoushian, 1999).

7. Perhaps the best comparison from nonacademia would be medical services, where the patient is both an input to production and has some influence on the final outcome by the extent to which he/she follows the doctor’s orders.

8. It should be noted, however, that there is no clear evidence of any differentials in an institution’s instructional outcomes resulting from the use of regular versus nonregular (e.g., part-time) faculty.

9. One of the authors of this paper is a member of the steering committee at UNH and has participated in the development of the RCM system.

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