



# RESPONDING *to* RESOURCE CONSTRAINTS

## *A Departmentally Based System of Responsibility Center Management*

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**T**his decade's mix of tight funding and rising costs has increased demands for public universities to adopt more efficient and effective financial management systems. Until recently, virtually all universities got by with centralized budgetary and planning systems run by senior administrators. Such systems provide little fiscal decision-making power to the academic units that generate university revenues. Instead, academic units vie with one another for centrally held funds (the "begging system") and have little flexibility in the way they use those funds. Centralized systems provide academic units with few incentives for change and little ability to respond to new conditions. Under such systems, faculty either are oblivious to the relationship between their programs and the fiscal operations of the university, or they have a sense of disenfranchisement from fiscal decision-making, or both.

In contrast, several universities have now turned to Responsibility Center Management (RCM), a financial management model that decentralizes fiscal authority and responsibility. By granting significant financial decision-making power to the academic units that generate university revenues, RCM enables these units to become more directly involved in planning the use of resources and in accountability for outcomes.

Under RCM, the income, growth, and development of academic units depends on their willingness and ability to control costs while simultaneously providing academic programs of high quality and value to their constituencies. A major feature of RCM is the flexibility it allows deans to shift funds from one spending category to another, depending on need, with accountability only for the total.

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The major downside to RCM is that, if left to operate without constraints ("every tub on its own bottom"), academic programs can become driven entirely by financial entrepreneurship. An ill-thought-through RCM can balkanize academic units by promoting competition for students and resources, making it difficult for them to work toward a common vision or set of academic goals.

**I**n July of 1989, Indiana University-Purdue University Indianapolis (IUPUI) became the first public university to implement RCM, under the leadership of Indiana University's then president Thomas Ehrlich and IUPUI Chancellor Gerald Bepko. IUPUI is the most comprehensive university in Indiana, enrolling over 27,000 students in 17 schools that deliver 180 undergraduate, graduate, and professional degree programs. IUPUI accounts for more than 60 percent of the external funding awarded to Indiana University; about 70 percent of the \$125 million awarded to IUPUI faculty in FY 1995-96 was generated by the School of Medicine, and 30 percent by other units, including the School of Science.

In this article, we first describe how the School of Science used RCM to achieve higher academic and research goals. Then we say what IUPUI has learned as a campus about RCM.

### **RCM IN THE SCHOOL OF SCIENCE**

#### ***1. In the Beginning: 1989-90***

The School of Science, along with the School of Liberal Arts, is a core unit in the delivery of undergraduate education at IUPUI. It has heavy service course responsibilities to the rest of the university, particularly in Mathematics, but also in Psychology and Biology. When RCM was instituted in 1989-90, the school had 102 faculty in its seven departments—Biology, Chemistry, Computer and Information Science, Geology, Mathematical Sciences, Physics, and Psychology. With an annual in-

come of \$18 million, it enrolled 882 undergraduate majors and 134 graduate majors, including nine PhD candidates. The school was located six miles from the main campus in a building that was inadequate for either teaching or research functions.

Like the other undergraduate schools at IUPUI, the School of Science was chronically underfunded compared to the undergraduate schools of other public universities in Indiana (a condition that remains uncorrected today) and relied heavily (and still does) on a cadre of excellent part-time instructors.

Nonetheless, the school's—and IUPUI's—potential and aspirations were high. The general caliber of instruction was quite good, and a significant number of faculty had established first-rate research programs. Five of the seven departments (Biology, Chemistry, Mathematical Sciences, Physics, and Psychology) had begun training PhD students a few years earlier. With enrollments growing, new facilities were being built and were scheduled to open in 1992.

In addition, the national overproduction of PhDs had resulted in a buyer's market for young, top-notch faculty. Taking advantage of this market, however, required raising the school's relatively low (\$28,000-\$32,000) starting salaries and providing a start-up package more substantial than the \$20,000 maximum then available. Finally, there were substantial, unpredictable expenses from moving to new buildings as well as shake-down problems once in the new facilities.

It was during this period of change and rising aspirations that one of us (D.L.S.) arrived in the summer of 1989 as the new dean of the School of Science. The question to be answered immediately was, How could RCM be used most effectively to provide the funding necessary to enhance the school's academic and research quality by attracting the best young faculty and to provide the other needs of a growing and aspiring academic unit?

## **2. Devolvement of RCM to the Departmental Level**

The RCM model chosen by most IUPUI schools allowed deans to maintain tight control of their schools' budgets, which meant each dean was free to use funds independently of the central administration. The "begging system," however, remained in place at the departmental level. Departments were given allocations according to the same centralized, mosaic system of expenditure categories with specific resources allotted for each. If more money were needed for a particular expense category, the department chair would lobby the dean for the additional funds.

The RCM model implemented in the School of Science was different. Its unique feature was the devolution of a significant share of financial decision-making to the departmental level. This strategy was designed to maximize RCM's inherent incentives while minimizing its potentially negative side effects. Financial decision-making authority was shared between the dean and the department chairs in such a way that the chairs had decision-making authority over spending, while the dean kept enough leverage to guide the school as a whole toward

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both general and specific school and university goals. The decision to organize RCM around a concept of maximally shared financial authority and responsibility was predicated on the following facts.

- Since virtually all income is generated by departments and most of it is spent by departments, it is appropriate that most decisions about spending be made by those departments.

- Department faculty and chairs ultimately design and implement academic curricula and research programs. Not only are they the disciplinary experts, but they are also closest to the day-to-day problems and challenges that affect revenues and expenses.

- Decentralizing financial decision-making authority to departments facilitates the quickest responses to solving problems and meeting shifting challenges.

- Incentives to solve problems and meet shifting challenges are most effective when responsibility is distributed most widely (the principle of subsidiarity). Faculty have a greater sense of responsibility for, and control over, their own destiny and that of their department, thus increasing morale.

- If multiple departmental needs require attention (for example, graduate program growth, teaching equipment purchases, and space renovation), the chairs' fiscal authority allows resources to be more quickly and efficiently focused on meeting these needs.

The School of Science's total income consists of 1) general fund income, which includes the centrally allocated portion of IUPUI's state appropriation, plus income from student tuition and fees; and 2) income from indirect cost recovery (ICR), which currently totals approximately \$800,000. From this income, the school is responsible for covering all of its own expenses and its share of campuswide and universitywide administrative overhead. Any deficits are carried forward and must be made up with income generated during the next fiscal year.

Under the School of Science RCM model, expenditure of income involves five steps. The first step is to decide which positions will be filled and with what kinds of faculty. The dean decides which departments will receive new or replacement positions, based on the needs of the school and the departments. These needs are determined by two school committees: the Steering Committee, made up of an elected faculty president and representatives from each department, and the Council of Chairmen, consisting of department chairs, the faculty president, and the dean's office staff. The types of faculty members to be hired are decided by the department.

The second step is to subtract, from the total general fund, the funds necessary to pay the school's fixed expenses for the fiscal year. (ICR is handled separately; see below.) Fixed expenses are defined as all faculty and staff compensation (currently 46 percent of the total general fund income), taxes for support centers (currently 41 percent, which is approximately equivalent to the state appropriation allocated to the School of Science), and a student technology fee fund (approximately 1 percent), which is used to continually expand and upgrade the school's instructional technology. For reasons that will be discussed below, part-time instructional salaries are not included

as fixed expenses. This subtraction leaves 12 percent of the total general fund as flexibly allocatable dollars to pay for operating expenses, which we call the "allocatable general fund" (AGF). For the 1997-98 fiscal year, the AGF is approximately \$3.2 million in base money.

The dean is responsible for determining how the AGF is to be allocated. In step three, the base set-asides that will be used to pay for start-up costs for new faculty hires, matching funds for external grants, building repairs and renovations, and discretionary items, such as support for conferences organized by school faculty, are subtracted from the AGF. These amounts have varied from about 18 percent to 25 percent of the AGF. The amount allocated for set-asides is determined by how many faculty positions are being filled, the amount of matching money faculty have requested for proposals submitted over the last six months of the fiscal year, and the number of planned conferences. The amount dedicated to renovations and repairs is a best guess based on previous years.

In step four, the dean allocates the remaining AGF funds to departments and the dean's office as block grants. Four percent of this amount is consistently set aside to operate the dean's office, which also receives 10 percent of the ICR funds generated by the school (see below). Department block grants are composed of funds generated by tuition and by laboratory fees. Since laboratory expenses (and thus laboratory fees) differ among disciplines, each department receives all of the laboratory fee income it generates.

The tuition portion of the grant is allocated in proportion to the percentage of total school credit hours generated by the department, with adjustments made for inherent variations in departmental costs, income-generating capacity, and developmental needs. Income-generating capacity and costs vary widely among departments according to the number of majors, the number of enrollments in service courses offered by the department, and the types of instructional equipment and supplies required for instruction.

Currently, the Departments of Biology, Psychology—and especially Mathematics—generate enough revenues to exceed their variable costs, whereas the Departments of Chemistry, Computer and Information Science, Geology, and Physics do not generate enough to cover their variable costs. Some of the "extra" income generated by self-sufficient departments is, therefore, used to subsidize the non-self-sufficient departments, while funds are given back to the self-sufficient departments whenever possible. It should be noted that although non-self-sufficient departments receive subsidies for their fixed costs as well as their block grants, fixed expenses are viewed as the responsibility of the school as a whole; thus, the subsidies are most visible in the block grants.

Both self-sufficient and subsidized departments are expected to develop their programs in ways that add academic value for students, develop research opportunities, and, in the case of the subsidized departments, reduce their required subsidies.

- The Department of Psychology, for example, has increased enrollments and external funding by developing academic and research programs in rehabilitation psychology and the biological psychology of addictive behaviors.

- A new interdisciplinary program is being proposed in regenerative biology—a rapidly emerging science of tissue restoration—to be centered in the Department of Biology.

- The Department of Mathematical Sciences has developed a program in applied mathematics and has received significant NSF funding for a proposal to redesign the mathematics curriculum in ways that better connect mathematics to other disciplines.

- The Department of Geology has developed a new interdisciplinary program in earth and environmental sciences that has the potential to generate additional income through increased student enrollments and contract and discovery research.

- The Department of Computer and Information Science has been steadily increasing its enrollments in this high-demand area and developing new research and academic programs in visualization, distributed computing, and software development that will increase its income.

- The Departments of Chemistry and Physics are investigating the possibility of developing a program in materials science, an area of interdisciplinary basic research with enormous potential for applications.

We recognize, however, that complete self-sufficiency of some departments may not be achievable. Ultimately, it is the value of a department's or program's teaching, research, and service to its constituents—balanced against its costs—that determines whether it will continue to be subsidized, and at what level. The School of Science RCM model thus stresses both financial independence and interdependence of the departments within the school (the "part vs. whole" relationship), thereby attenuating the tendency toward balkanization.

For many faculty, the idea of including a cost/value analysis when considering what academic endeavors will be subsidized and by how much runs counter to the prevalent belief that scholarship in any area should be supported for its own sake. The latter view was cemented during the post-World War II era of unparalleled expansion of universities under the largess of federal and state governments. That growth, however, had in it the seeds of its own limits. The real resources to support research actually began to plateau in the 1970s and have been declining for over a decade. We are unlikely to see another such period of academic prosperity anytime soon, which means future generations of academics will have to understand more thoroughly the relationship between their activities and the resources available to carry them out. Fiscal responsibility is no longer a problem just for provosts and deans, but for department chairs and faculty, as well.

The fifth and final step is to allocate ICR. In the School of Science, ICR is kept separate from the AGF and is used exclusively for expenses associated with research infrastructure. Twenty percent of the campus's ICR income is invested by the central administration in a campus Research Investment Fund (RIF). This fund is used to pay overhead and to invest in equipment and facilities that will benefit interdisciplinary research activities across the campus, which makes IUPUI more competitive for external funding. RIF funds are awarded to research groups on a competitive basis and have provided high-impact infrastructure that otherwise would not have been possible. The remaining 80 percent of ICR income is returned to the schools that generated it.

In the School of Science, the dean takes 10 percent of the school's total ICR to pay for research overhead expenses and returns the remaining 70 percent to the departments in proportion to the total amount each had generated. This rate of return has allowed departments to make significant investments in their research infrastructure, which is a strong incentive for

faculty to seek external funding. Such investments also have a salutary effect on undergraduate education, since much of the equipment purchased and used by faculty and graduate students is also used to support undergraduate research projects.

Department chairs have a high degree of flexibility in how they use their block grants to achieve departmental goals. With the exception of ICR funds, which can be used only for research, block grant funds can be moved freely among expenditure categories and new categories can be created. The chairs have an incentive to control costs, because they reap the benefits of the savings. Conversely, if they overspend, they will not (in reality, cannot) be bailed out by the dean.

A good example of an incentive to control costs is the funding of part-time instruction. The need for part-time instructors varies from department to department, but is particularly high in mathematics, due to large enrollments in developmental mathematics courses. Under the former centralized financial management system, chairs in the School of Science were given a specific allocation for part-time instruction. If this amount were exceeded by enrollment changes or other factors, the chair would request additional funds from the dean to hire additional part-time instructors.

On the surface, this appears to be a perfectly reasonable mechanism to fund part-time instruction, but analyzed from an RCM perspective, the dean concluded that part-time instruction was a black hole into which more and more money was disappearing. In addition, there was no incentive for departments to contain these costs as long as they were the responsibility of the school as a whole. When responsibility for part-time instructional funds was placed at the departmental level, chairs began to plan carefully how to keep the part-time instruction costs within manageable limits or to shift cost savings from other expense categories into part-time instruction if that better suited the department's needs and goals. For example, section size can be increased (but not beyond a reasonable limit) and section numbers decreased; full-time faculty can be used more effectively to drive down part-time instructional costs; or savings from the supplies and expense category can be shifted to part-time instruction.

The funding of graduate student tuition and fee remission offers a similar example, but one that has some negative consequences. Like other universities, IUPUI remits tuition and fees as part of a financial package to attract high-quality doctoral students. In the School of Science, tuition and fee remission is often covered by including tuition and fees in the direct costs of external grants. In other cases, however—particularly those involving students who are teaching assistants—tuition and fee remission must be covered by departmental block grants.

This requirement ensures that departments admit only the number of PhD students they can afford, rather than engaging in a free-for-all competition to recruit as many students as possible, a tendency that occurs if tuition and fee remission are the responsibility of the school. PhD programs thus expand at the rate of departmental growth and productivity. There is a downside to this process, however, which results from a combination of Indiana University's policy on tuition and fee rates for out-of-state graduate students and the method used by the IUPUI campus to levy taxes for campus overhead.

Tuition and fees for out-of-state graduate students are nearly triple the rate for in-state students, and IU will not grant in-state residency status to graduate students as long as they are students,

even if they otherwise classify as legal residents of Indiana. Thus, out-of-state graduate students cost departments dearly in terms of tuition and fee remission—even when the remission is covered by grants, since grants can be charged only the in-state rate.

The cost to the School of Science (and by extension, to departments) is exacerbated further by the fact that IUPUI counts the tuition and fee remission as income to the school (that is, the remission is treated as if the student actually paid tuition and fees) and taxes it at the rate of 41 percent, even though the school never sees the income. This tax burden falls as an additional fixed expense on real tuition and fee income to the school, reducing the AGF. Other institutions adopting a system like the School of Science's should take steps to avoid a similar situation, since it imposes severe financial limitations on the maintenance and development of graduate programs. Despite these constraints, the School of Science has developed a high-quality set of PhD programs, which currently enrolls 90 students, an increase of 80 students since 1989.

### 3. *The Carry-Forward Principle*

A crucial feature of RCM at IUPUI is the ability of schools to carry forward, from one year to the next, any residual year-end funds generated through savings or extra income generated by greater-than-projected enrollments. The School of Science used this "carry-forward principle" to generate approximately \$380,000 in cash for FY 1990-91 that could be used for new faculty start-up packages, matching funds for grants, upcoming moving expenses, and the establishment of a small enrollment shortfall reserve fund.

This was done by taking advantage of the fact that enrollments and the concomitant fee income were on an upward trend. Instead of matching the projected 1990-91 income to projected credit hours, the income was projected to be 2 percent less than that indicated by the projected credit hour production. This meant that the AGF, and thus department block grants, were less (by about 17 percent) than what they might have been that year.

The department chairs and faculty, however, agreed that the flexibility in using block grant funds more than made up for this. As one Department of Biology faculty member described this flexibility, "We felt absolutely rich." This practice of basing income on a lower-than-projected number of credit hours has continued, ensuring that there will be carry-forward cash funds to pay for all the items that have variable and unpredictable costs from year to year. These funds have played a crucial role not only in supplementing the school's budget in critical areas over successive fiscal years, but in meeting unanticipated expenses. For example, unbudgeted, after-tax income to the school generated in one year by higher-than-budgeted enrollments has been used to buffer the school against enrollment declines in the following year, as happened in 1993-94.

The carry-forward principle was extended to departments in the School of Science as well, which allowed them the same maximum flexibility for developmental planning, for dealing rapidly with unexpected expenses, and for taking advantage of anticipated, as well as unanticipated, opportunities. These funds, for example, could be used to augment allocations to departments from the student technology fee in order to provide computers for student laboratories. Equipping labs with computers is an expensive proposition, which not only includes buying the equipment, but may also involve the costs of

software, data acquisition devices, printers, networking, and room renovations. It is essential that all the equipment in an instructional laboratory be the same for each student, which means a full complement of equipment must be purchased at one time. While it is often possible to get a package discount from vendors, taking advantage of such a deal means the purchasing unit must have ready cash available. The carry-forward principle provides for just that; plus, departments can use these funds to enrich their supply and expense budgets, to meet unanticipated equipment repair costs, or to seed the development of new academic initiatives.

Unanticipated in this liberal application of the carry-forward principle was just how successful departments would be in reinventing costs and generating new income. By FY 1994-95, the departmental and dean's office carry-forward stood at over \$2 million total, of which approximately \$1 million was in unspent ICR and start-up funds that had not yet been spent by the faculty who received them (initially, there was no time limit on their use). To avoid unproductively tying up too much in carry-forward funds, the departments, and the school as a whole, were limited in FY 1995-96 to 10 percent of their AGF block grant—plus start-up funds had to be used within a new limit of two years. A plan for using the carry-forward must be submitted to the dean each June, one month prior to the start of the next fiscal year. Two years of living under these rules suggests that the allowed carry-forward amount probably should be increased to 15 to 20 percent, in order to have the maximum impact without crossing over the line into hoarding. A typical AGF block grant for the school's smaller departments is between \$130,000 and \$180,000, and, for the larger departments, between \$400,000 and \$700,000. A 10 percent carry-forward would amount to between \$13,000 and \$70,000, which is sufficient for smaller, but not larger, initiatives. An increase to 15 to 20 percent would allow much more flexibility—up to \$140,000 for larger departments. No limit has been set on the amount of carry-forward for ICR funds, because they are often the only way to cover a research program's costs during a hiatus in grant funding.

The carry-forward principle has proved vital to the success of the School of Science and its departments. The dean has been able to use carry-over funds to create additional positions, to increase start-up funding for new faculty research programs, to strengthen undergraduate advising, mentoring, and academic programs, to strengthen graduate programs, to purchase new instructional and research technology, to accommodate repairs and renovations (which never seem to end), and to keep productive research programs going during a hiatus in external funding.

The school has never been better able to engage in long-range planning—an essential ingredient in all programs, but especially in the sciences, where many purchases are far too expensive to be paid for by the funds available from any given year. The ability to engage in this kind of planning reduces much of the anxiety department chairs feel about where the money will come from to fund essential projects, to take advantage of opportunities that arise to improve their programs, and to meet unanticipated expenses.

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#### **4. The Part-Whole Relationship**

Another essential ingredient for RCM to be maximally effective at the departmental level is that chairs thoroughly understand the relationship between the fiscal health of their department and that of the school. Under RCM, chairs cannot think solely in terms of their department; ideally, they must also be able to think in terms of the overall development of their school. Likewise, deans cannot think solely in terms of their school, but must also think in terms of the university as a whole—and be willing to contribute to the development of that whole.

Chairs must be accountable to deans for good financial management practices, and they must learn to be adept at using their block grants in ways that promote excellence in teaching, research, and service, without overspending. By the same token, it is essential that deans not micromanage departments but put their trust in the chairs' ability to do a good job. They must be willing to accept the fact that chairs will occasionally make errors and understand that these errors will be more than compensated for by the accomplishments of the chairs. The deans' share of administrative and fiscal authority is sufficient to influence the schools' overall direction and quality, but specific ways of achieving these ends are best left up to departments. Needless to say, deans must be accountable to the campus administration for good stewardship of school funds.

While this part-whole perspective is easy to understand and embrace in principle, it is difficult in practice for chairs—particularly those of self-sufficient departments—to maintain. Chairs will have a natural tendency, fostered by pressure from their faculty, to view all the income their department generates as belonging to the department, rather than to the school. If, in times of increased income, budgets of self-sufficient departments are not proportionally increased by the dean each year, faculty will resent subsidies going to departments that are not self-sufficient. Any situation that increases fixed expenses and decreases the money available for allocation as departmental block grants can bring more resentment about subsidies, because the budgets of all departments will suffer to varying degrees.

Achieving the proper balance between the parts and the whole requires thorough, candid, and ongoing discussion between the dean, chairs, and faculty about the financial condition of the school and its departments, within the context of each one's operational and developmental needs. An important point is that, while department chairs or faculty committees should be consulted, their views cannot be used to decide how final AGF allocations are made to departments, because they are (and must be) advocates (that is, special interest groups) for their individual departments.

The dean alone, as the advocate for the school as a whole, must be responsible for determining departmental allocations, since the dean sits in a position with the least conflict of interest within the school and is the one held responsible by the campus administration for the school's fiscal and academic health. In the School of Science, there have been numerous debates about departmental allocations and how they should be made, but so far, the part-whole dialogue has generally been a

healthy and productive one. By and large, the department chairs have been willing to "spread the wealth" in order to maintain and develop the school as a whole, and they have been excellent fiscal stewards.

### **5. Progress of the School of Science Under RCM**

The School of Science has made significant progress under its departmentally based model of RCM. Today, the school has 134 faculty and enrolls nearly 1,500 majors, including nearly 300 MS and PhD students (an increase of over 130 percent since 1989-90) and 1,200 undergraduates (an increase of 36 percent since 1989-90).

The school has an annual income of nearly \$28 million (an increase of 56 percent), and starting salaries for assistant professors have been raised to \$40,000 to \$44,000 (an increase of 43 percent). Since 1989-90, the school has generated enough additional funding for 10 new faculty positions. The campus administration generously gave us seven more, and another 15 were generated by splitting the salaries of retirees and adding additional dollars to create two positions from one. Seventeen new staff positions also have been added during this time. The average start-up package for new faculty has been increased by over a factor of five, from \$20,000 to \$110,000 (ranging from \$15,000 for the least expensive discipline, mathematics, to \$160,000 for the most expensive discipline, physics). External funding to faculty has increased by a factor of four, from \$1 million to \$4 million. Investment in new technology has been made that would not have been possible without RCM. Finally, RCM has made it possible to account precisely for expenditures in all categories and to show how they have, or have not, benefited departments and the School of Science.

### **REVIEW OF RCM AT IUPUI**

What general lessons have we learned about RCM from our experience in the School of Science and other schools at IUPUI? A potential problem is that RCM could balkanize academic units by promoting competition for students and resources. While revenues tend to follow enrollments under any type of university financial management system, under RCM, deans quickly realize that income to their school or college follows enrollments on a dollar-for-dollar basis. If left to operate without constraints, academic programs can become overly driven by financial entrepreneurship and can end up neglecting student needs and quality. The result can be a Darwinian scenario in which the university has difficulty working toward a common vision and set of academic goals.

Recently, IUPUI conducted a five-year review of RCM. Although some deans, chairs, and faculty felt that RCM made money the primary focus at the expense of academic excellence and integrity, most greatly preferred it to the previous centralized system and did not feel that it compromised academic quality. A common sentiment expressed by deans was, "If RCM were discontinued, I would not want to remain in the deanship." The review identified four general principles that, if followed, we believe would enable RCM to work in harmony with academic objectives.

**Unanticipated in this liberal application of the carry-forward principle was just how successful departments would be in reining in costs and generating new income.**

• First, the academic plan must be the prime basis for decision-making. Part of that plan must include a culture of excellence and accountability—requiring internal and external assessments of program quality, as well as value-added to constituents (primarily students). Administrators and faculty must avoid attempts to apply the academic equivalent of "Gresham's Law" (bad money drives out good), in which weak courses drive out rigorous ones in an effort to bolster short-term enrollments.

The success of each academic unit depends on that of every other unit, and subsets of these units must collaboratively develop and share resources, rather

than compete for them. To ensure collaborative relationships, there must be assurances that schools will not be allowed to raid each other's "bread and butter" courses. Since professional schools are often able to offer courses similar to those in the liberal arts and sciences (although not as comprehensively), either boundaries must be established that inhibit such encroachment, or a total restructuring of the university should be contemplated. This would integrate professional schools with schools or colleges of arts and sciences. IUPUI has chosen to establish boundaries but also to foster collaborations between the arts and sciences—as well as between them and the professional schools—in developing new courses and curricula.

• Second, RCM is not a magic formula that can substitute for strong, effective administrative management and leadership or the need for judicious decision-making by administrators. RCM neither creates nor destroys dollars; its effectiveness as a tool depends upon the skills of the people using it. Campus administrators and deans must collaborate in establishing a congruence of vision, values, and goals across all levels of the university, so that the individual academic units are forged into a coherent whole.

At the same time, campus administrators need to avoid micromanaging how deans and department chairs achieve university objectives. To lead and shape the university, the campus administration itself must have sufficient resources for reallocation purposes. At IUPUI, these resources are generated by a 1 percent tax on the university's total state appropriation, which allows the chancellor to implement strategic initiatives that build on existing excellence in academic and research programs and/or to launch new and innovative programs.

• Third, campus administration must live by RCM principles. Public goods—such as the physical plant, technology, and the library—must receive funding that is adequate, but at taxation levels that the academic units can support financially and intellectually without seriously attenuating RCM's underlying incentives. At IUPUI, support centers and administrative charges are funded by a tax on schools that is proportional to tuition and fee income. Thus, for schools with high tuition and fee income, like Liberal Arts and Sciences, the tax is about 41 percent, but the average for schools on the campus is 25 percent. Inevitably, these taxes invoke direct, healthy conversations about the quality and costs of the services delivered by the support centers.

Often, even more fundamental questions are asked, such as

whether the university should provide a particular service at all, or if it should be subcontracted out or rented. To serve as a check and balance on the potentially excessive growth of support centers, the centers must justify their budgetary requests and expenditures to both faculty and deans' budgetary committees, which advise the chancellor.

• Fourth, academic units must be allowed to carry forward residual year-end funds generated by good fiscal management. This principle is one of RCM's most powerful and progressive features, without which much of its impact is lost. Allowing academic units to keep these funds is preferable to the typical "use it or lose it" approach of centralized systems, which requires spending or mortgaging all available income. The latter approach not only leaves units vulnerable to large deficits when there are unexpected expenses or losses in income, but encourages the suboptimal use of year-end residual funds simply to avoid losing them either in the current, or next, fiscal year. The carry-forward principle is such a powerful incentive that institutions where it is not permitted would be advised not to implement RCM, because this provision is essential to obtaining maximum benefits.

The carry-forward principle, however, is irrelevant unless an academic unit actually has the potential to generate funds over and above its projected costs. As described above, the School of Science "forced" the generation of extra year-end cash funds by slightly under-projecting credit hours, as opposed to generating extra funds by constructing a budget based on projected credit hours and then hoping for an increase in enrollments above that projection. This strategy also left the school less vulnerable if enrollments declined, instead of remaining steady or increasing.

The effect of a downturn in enrollment after constructing a budget to match projected credit hours can be illustrated by what happened to our School of Liberal Arts. At the end of FY 1992-93, Liberal Arts based its 1993-94 budget, including the hiring of several faculty, on a predicted rise in credit hour enrollments. When enrollments actually declined, the school was plunged into a deficit of over a half million dollars, necessitating the closing of its theatre program, a hiring freeze on open positions, austere restrictions on supplies and expense spending, and the securing of a loan from the campus administration. Over the last two years, however, Liberal Arts has recovered nicely from this deficit by holding to some of its austerity measures while being more conservative in its enrollment projections. In fact, it has not only repaid its loan, but shows a year-end cash balance.

In general, if the principles outlined above are followed, RCM will far outperform a centralized management system under similar sets of conditions without compromising academic quality. Using these principles, the advantages of RCM that we have found to be the most beneficial are as follows.

• *The inherent incentives to maximize income and curb unnecessary costs.* RCM is a powerful incentive for good teaching and research, course expansion, creative course scheduling, and general academic program enhancement, all of which increase the quality of—and ultimately the financial resources of—academic units.

• *The accountability for use of resources and the ability to precisely track how they are used.* Deans are accountable to

the campus administration for good fiscal stewardship in the planning and implementing of the university's academic plan, and vice versa. RCM allows deans and department chairs to track precisely how funds are spent and to judge whether the expenditures are justified.

• *The ability of academic units to autonomously shift funds between spending categories to meet unanticipated shortfalls or needs in one area or to take advantage of immediate opportunities in another.* The flexibility associated with decentralization saves time and effort (and thus money) and can produce quick results, thus increasing effectiveness and efficiency.

• *The ability to fund new initiatives from current programs if the latter generate income above and beyond costs.* Units with large service course obligations and low costs (particularly departments such as Mathematics and English) are much richer than smaller units. Some of the income generated by "rich" units can be used to subsidize the development of underdeveloped—but vital—smaller units, so they can better support themselves. Small units that do stand on their own, although they may have less discretionary spending than large ones, nevertheless can thrive because they have the flexibility to shift funds from one category to another, as well as to institute measures both to generate additional revenues and control their costs.

• *The ability to use carry-forward funds as a developmental long-range planning tool.* Without this incentive, much of the power of RCM is lost.

## RCM: A PARTIAL ANTIDOTE

We believe that this type of decentralized management is at least a partial antidote to the outmoded, short-term approach of simple downsizing as a means of increasing organizational efficiency and effectiveness. In the long term, being competitive requires more than just cost-cutting by decreasing the number of people while increasing the productivity per person, because there are inherent limits to this approach. Long-term competitiveness requires that we make strategic, focused investments in human and material capital that increase the quality and value of our programs. The RCM model described here allows the kinds of investment strategies to be made that can achieve these goals.

Our model is not perfect, and it does not resolve all the tensions between administration and faculty over whether program costs and accountability should be part of judging what is of value to constituents and what forms of scholarship should be valued for their own sake, regardless of cost. Universities cannot possibly support every academic or scholarly endeavor on the basis of its intrinsic worth alone, but quality of teaching and scholarship must be preserved in those endeavors that are selected.

We think our model can be adapted for universities of different sizes and missions, from small liberal arts colleges to large public teaching/research universities like ours. It can serve as a starting point for the further evolution of decentralized financial management systems. For example, the model could be combined with and/or be enhanced by economic models used to analyze costs versus value of academic programs, such as the one reported recently by the University of Rhode Island. (See W. Roush, "URI Tries Downsizing by Formula," *Science*, Vol. 272, 1996.) When this RCM model is used, the ultimate winners are our students and the public, who are getting the maximum return for their education dollars. □