STRETCHING THE HIGHER EDUCATION DOLLAR

AMERICAN ENTERPRISE INSTITUTE

SPECIAL REPORT 1

Initiatives for Containing the Cost of Higher Education

William F. Massy | April 2013

Preface

The recent fiscal crisis has brought American higher education to a watershed moment. After decades of expansive growth in enrollments and spending, state budget cuts and damaged endowments have driven double-digit increases in tuition over the past decade. In the wake of significant increases in federal student aid over the past four years, a growing federal deficit suggests that aid programs will be hard-pressed to keep up with the growth in tuition prices. Meanwhile, lackluster employment outcomes for recent college graduates and ballooning student loan debt have created an increasing sense of disillusionment among policymakers and the public alike. More than ever, Americans are questioning whether a college degree is worth the cost of admission.

For their part, most colleges and universities have been reticent to rethink their cost structure—that is, what it actually costs to provide the education they deliver—in light of these fiscal challenges. Instead, they have typically chosen to raise tuition, cut course offerings, even close the door to qualified, tuition-paying students. In an era of declining public support and trust, battening down the hatches and waiting for sunnier days is not a recipe for regaining public confidence, let alone meeting our human-capital needs.

But the future is not as bleak as it may seem. The stark fiscal challenges facing governments and endowments are forcing forward-thinking higher education leaders and entrepreneurs to reconsider the traditional model and to propose new, lower-cost modes of delivery and credentialing, arguments that resonate less during boom times. The prospect of reinventing higher education through online learning, long dismissed as being of low quality, has been renewed with the emergence of massive open online courses, some of which bear the imprimatur of elite universities.

Elsewhere, some institutions and systems are experimenting with ways for students to earn their degrees more quickly and at a lower price. Even President Obama has chimed in, famously declaring in his 2012 State of the Union address, "Let me put colleges and universities on notice: if you can't stop tuition from going up, the funding you get from taxpayers will go down."

To make sense of these developments, AEI's Education Policy Studies department, along with Kevin Carey of the New America Foundation, commissioned new research from leading academics, journalists, and entrepreneurs on how to do more with less in higher education. The collection of essays was first presented at an August 2012 research conference entitled "Stretching the Higher Education Dollar." You can find conference drafts of the papers online at www.aei.org/events/2012/08/02/stretching-the-higher-education-dollar/. A revised set of those papers will be released as an edited volume from Harvard Education Press in summer 2013.

This forthcoming volume does a superb job of identifying the barriers to cost containment and the opportunities to fundamentally redefine the cost structure of higher education in the future. But after conversations with stakeholders across the country, we also recognized an appetite for concrete, near-term steps that policymakers and leaders can take to help get control of college costs, as well as clearer data on how higher education revenue and spending have changed over time. To help satisfy these needs, we commissioned three new pieces of research.

In "Initiatives for Containing the Cost of Higher Education," William F. Massy, professor emeritus and former vice president for business and finance at Stanford University, offers a comprehensive reform agenda for policymakers interested in cost containment. Massy lays out a series of initiatives that, working in tandem, can promote the larger goal of compelling colleges to spend money wisely. Among the individual reforms Massy proposes are creating a national database of cost-containment practices, a "Race to the Top" for college productivity, and process audits for all public institutions. The primary

aim, Massy contends, is to help provide the necessary information for a vibrant higher education market in a way that current policymakers and college leaders can get behind.

In "Addressing the Declining Productivity of Higher Education Using Cost-Effectiveness Analysis," Douglas N. Harris, associate professor of economics and university endowed chair in public education at Tulane University, takes a rigorous, empirical look at the cost-effectiveness of popular higher education policies and programs. Harris argues that policymakers and school leaders have far more control over productivity than assumed, but tend to lack the requisite information on which strategies will be most productive. Running through an array of these programs and policies—from class-size reductions, to various financial aid programs, to student services—Harris provides a framework that can help college leaders determine which policies and practices provide the most bang for our higher education buck.

Finally, in "Public Policies, Prices, and Productivity in American Higher Education," public policy consultant Arthur M. Hauptman examines the impact of federal and state policies on the escalating costs and diminishing productivity of higher education. After a brief overview of trends over the past 40 years in college tuitions and spending, Hauptman offers a series of suggestions for federal and state policy reforms. Among these are restricting the use of private student loans, pegging tuition at public institutions to a general measure of a family's ability to pay (such as median family income), and rethinking funding formulas to invest more in lower-cost public institutions like community colleges.

We are excited to release these three papers as the concluding part of our Stretching the Higher Education Dollar series. Although the ideas in each are certainly open to discussion, we hope they present an informative and provocative set of actionable recommendations for policymakers and college leaders. For further information on the papers, or with any questions, please visit www.aei.org/policy/education/ or contact Daniel Lautzenheiser at daniel.lautzenheiser@aei.org.

—Andrew P. Kelly
Research Fellow, Education Policy Studies
American Enterprise Institute

Initiatives for Containing the Cost of Higher Education

William F. Massy

How to contain the cost of colleges and universities is attracting much attention in higher education policy circles. The reasons for the attention are not hard to fathom. Students and parents labor under ever-rising tuition rates. Schools feel they must spend more in real terms to build or protect their brand, by boosting faculty research and scholarship, enhancing the student experience, and so on. And to round out the perfect storm, most states are curbing higher education appropriations because of rising budget pressures.

The result is that many colleges and universities are experiencing financial difficulties in spite of yearly tuition increases—difficulties that often erode the quality of undergraduate learning. For example, restricted course offerings, large class sizes, and a high proportion of classes taught by adjuncts and other casual-payroll teachers are common features of the undergraduate experience at many universities. Faculty feel ever more stressed by these money-saving changes—which makes it more difficult to achieve innovations in the methodology and culture of teaching or even to sustain current levels of quality.

Failure to change will make traditional universities vulnerable not only to political forces but also to disruptive innovations from for-profit universities and online offerings. In time, much of the traditional sector will be seriously weakened, or worse, if it does not reinvent itself. Many, including myself, believe this would be extremely unfortunate because it would strand massive amounts of human and physical capital, damage our global competitiveness, and deprive both the best and most vulnerable in our population of the face-to-face teaching and mentoring that are best delivered in a campus setting.

So far, however, more has been said than done. The lack of traction is a major problem for students, their families, and the state and federal agencies that fund higher education. So what is to be done? The good news is that traditional campuses do not lack for opportunities to effect needed improvements. The bad news is that organizational and market forces work to sustain the status quo.[1]

I believe that more can and should be done on campuses—and by federal and state governments, foundations, and system-level administrations—to spur campus-level change. There have been many less-than-successful efforts to transform traditional universities, but at the same time there has been steady progress. Now the time appears right for a coordinated and concentrated attack on the problem. This paper presents a set of initiatives that, in my view, can make meaningful progress toward containing the cost of higher education and have the added benefit of being both politically and operationally feasible.

Before proceeding, however, it is necessary to clarify the term "cost containment." Higher education policymakers often reference two distinct concepts without differentiating between the two:

- *Productivity improvement:* Getting more from the resources provided to universities and colleges by reducing the cost of operations, boosting the quality of learning, or (ideally) both; cost-reducing initiatives must be accompanied by robust quality assurance to avoid learning degradation in the interest of apparent cost-effectiveness.[2]

- *Price moderation:* Holding down increases in net price to students—specifically, limiting the degree to which cost-saving productivity improvements are used to boost cross-subsidies and amenities instead of limiting tuition and augmenting financial aid.

Price moderation depends on productivity improvement, but not in a one-to-one relationship. Poor productivity leads to higher cost, which in turn forces higher prices. However, the fruits of productivity improvement can be used for purposes other than price moderation—for example, to provide faculty with more research time. Hence, policymakers must consider initiatives for both productivity improvement and price moderation.

William F. Massy is professor emeritus and former vice president for business and finance at Stanford University.

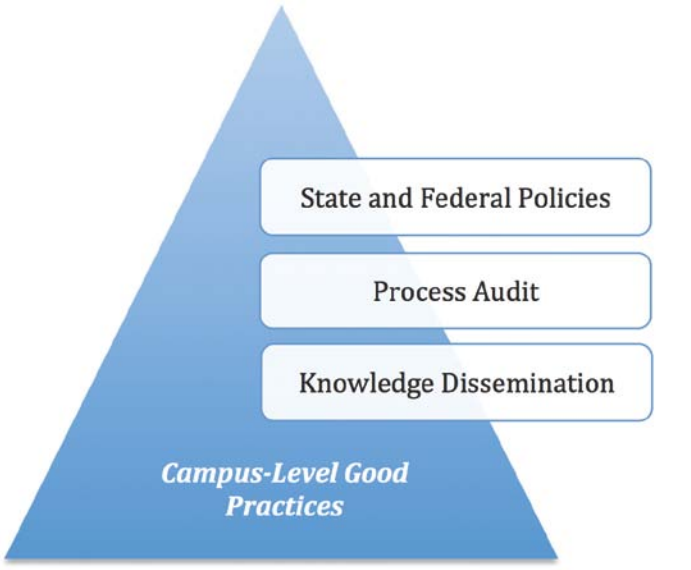
The initiatives to be presented cover both meanings of cost containment. Most are targeted clearly to one or the other, but where an initiative covers both, the overarching "cost containment" descriptor will be used.

A Hierarchy of Initiatives

Just as policymakers must recognize the two dimensions of cost containment, reforms must also acknowledge the multiple levels of higher education governance. As such, a narrow focus on one aspect of governance—federal policy or accreditation or campus-level leadership—will likely disappoint. Instead, reformers would be wise to consider a hierarchy of initiatives that considers each level of governance as part of a larger whole.

Figure 1 presents the hierarchy of initiatives that this paper will consider. The base of the pyramid refers to campus-level good practices. The action starts here, with changes campuses can make to improve productivity and moderate price. A decade ago, one would have been hard-pressed to find many campus-level good practices for containing cost, but now multiple options exist and more are emerging all the time. Unfortunately, however, the good practices are slow to penetrate the mainstream operations of traditional universities.

FIGURE 1
A HIERARCHY OF INITIATIVES



Source: Author

More can and should be done on campuses—and by federal and state governments, foundations, and system-level administrations—to spur campus-level change.

With a more systemic approach in mind, I present initiatives other entities—governments, foundations, and systemwide administrations—can undertake to spur campus-level adoption. I begin with a brief discussion of the hierarchy's base, promising campus-level practices, before discussing each of the levels above.

The initiatives presented in this paper are organized into three categories, as shown in the boxes at the right of the pyramid. Each category builds on the previous ones. *Dissemination* will propagate knowledge about good cost-containment practices across the higher education sector. *Process audits* assess the degree to which these practices have been adopted on particular campuses and also help jump-start the adoption process. Finally, *state and federal policy* initiatives identify actions that policymakers can take to accelerate the pace of change and permanently embed the needed transformations into the fabric of academic operations. It is worth emphasizing that an audit cannot work without standards of good practice to audit against and that the policy initiatives cannot work without the ability to assess institutional performance in relation to objectives.

Campus-Level Good Practices

The goal of this paper is to present policy ideas that can help spur the adoption of campus-level good practices, not to detail those good practices themselves. Nevertheless, it is important to understand the kinds of practices that campuses might adopt. I can provide only a brief summary here, but leaders and policymakers can access the large body of literature and experience on the various practices.

This section describes 12 broad areas of proven and emergent good practice for campus-level productivity improvement and price moderation. Among other things, these areas disprove the assertion that little or nothing can be done to effect the needed improvements. Each level has many examples and variants, and many of these can involve multiple specific practices. Some ideas will seem familiar, while others may initially seem unusual. Some have seen significant adoption, others are at the pilot-project stage, and still others are promising ideas that await development and trial. The appendix discusses each area in more depth and contains references to the original sources, which provide more detailed descriptions.

Productivity-Improving Initiatives

1. *Course Redesign.* Enlist faculty teaching groups in projects to improve the efficiency and quality of large-enrollment courses. The methodology involves organizing the teaching tasks into small bundles then finding ways to restructure them into configurations deemed likely to improve learning and lower cost. It has been applied successfully to many different disciplines on many campuses, most notably by the National Center for Academic Transformation.

2. *Advanced Technology Applications.* Go beyond so-called "bolt-on" applications (relatively quick-fix technology), like course management systems and Web content acquisition, to transform on-campus and online teaching and learning. Such applications often involve use of software "learning objects" to transform teaching in ways typically not reachable by simple course redesign. The rise of massive open online courses (MOOCs) exemplifies what can be done, but the most pervasive applications will be with on-campus students.

3. *Learning Science Applications.* Use concepts from cognition and psychology to design learning objects and activities that cater to the needs of students in better ways than traditional teaching methodologies. For example, instructors should overcome their expert blind spots, acquire relevant knowledge about their students' learning styles and bases of knowledge, and use the resulting insights to inform course design and the implementation of learning activities. Carnegie Mellon University has been a leader in developing these ideas.

4. *Service Science Applications.* Use the insights from this emergent field to enhance course redesign and the application of technology and learning science. One such insight, "coproduction," requires providers to ascertain recipients' capacity and motivation to participate actively in service provision so that they can devise and deploy processes and incentives that facilitate the joint efforts. Another requirement is the systemization of service delivery to reduce quality-eroding variation without undermining spontaneity.

5. *Degree Qualifications Profile.* Use this emergent tool to develop better learning objectives and metrics, based on careful and collaborative analysis of what graduates should know and be able to do, and to benchmark these against good practice in a wide variety of fields. Designed to be nonintrusive and participative as well as powerful, the tool opens the way for both improvement and "light touch" accountability for learning quality.

6. *Learning Metrics.* Redouble efforts to develop robust metrics for learning quality. Although institution-level normed measures of value-added learning are unlikely to be available soon, such metrics are or soon will be within reach of most individual programs. The possibility of developing scalable evaluation rubrics, for example based on the Degree Qualifications Profile, is particularly exciting.

7. *Academic Systems Analysis.* Apply the lessons from course redesign to analyze a university's portfolio of teaching and learning activities in systemic terms—for example, by exploiting legacy-system data in ways that invite inferences about efficiency and learning quality. Current efforts to identify bottlenecks in the path to graduation and thus decrease time to degree fall under this rubric, but it is possible to do a great deal more.

8. *Resource Utilization Models.* Analyze faculty workload and facilities utilization in enough detail to understand how they drive productivity and cost and what can be done to improve performance. Although analyzing faculty workload often generates resistance, such models need not be intrusive because the needed data often reside already in university systems.

9. *Activity-Based Costing.* Build on academic systems analysis and resource utilization models to estimate

the average and incremental cost for individual teaching activities. This new approach is needed because today's allocation-based cost accounting procedures in universities, though appropriate for overhead allocation, do not provide the activity-related data needed for productivity improvement.

10. *Business Process Reengineering.* Mount a systematic program for analyzing and improving administrative and support service operations. In effect, this is what course redesign and academically tailored systems analysis, resource utilization models, and activity based costing aim to do for the academic side. The difference on the administrative side is that the methodologies that businesses have developed can be applied directly to universities and indeed have been used on many campuses.

The pressing question is not whether cost containment is possible but how policy and advocacy can provide incentives for institutions to implement promising ideas.

Price-Moderating Initiatives

11. *Public Disclosure of Learning Metrics, Processes, and Rationales.* Reduce the market imperfections caused by today's huge shortfalls in reliable and valid information about education quality. The current shortfalls shift branding and competition away from quality and value for money to prestige based on research track records, selection ratios, and student amenities—factors that produce a self-fulfilling correlation with high tuition rates.

12. *New Price-Setting Policies and Practices.* Embed tuition and financial aid decisions in a multiyear financial plan and finalize them early in each year's budget process. Decisions at each stage should balance the institution's desire for revenue not only against market constraints but also with social responsibility.

Although it is unlikely that any campus will adopt all of the above in the foreseeable future, there is no valid reason why campuses should not be working on at least some of them at the present time. The pressing question is not whether cost containment is possible, but how policy and advocacy can provide incentives for institutions to implement these promising ideas.

Knowledge Dissemination

It is easy to forget that, while cost containment processes have become second nature in business and industry (and in higher education's for-profit sector), their feasibility and importance is relatively fresh in traditional higher education. I have long argued that some academic resistance to the adoption of productivity-improving practices is due not just to innate conservatism but also to a lack of understanding and fear of the unknown. Therefore, acquiring knowledge about how processes can be changed and the benefits of so doing is the essential first step toward improvement. The following initiatives are aimed at disseminating knowledge about good cost-containment practices and how to implement them.

Initiative 1: Create a national online, searchable good practices database to compile information about cost containment processes that have been used successfully in higher education. The Australian Universities Quality Agency's (AUQA) Good Practice Database (box 1) provides an excellent example of the approach.[3] Created as a byproduct of AUQA's process audit program, the database has proven valuable for motivation, benchmarking, and idea development.

The Multimedia Educational Resource Learning and Online Teaching database provides another example—albeit less directly applicable here because it deals with discrete learning activities rather than more systemic issues. Hosted by the California State University, it contains almost 40,000 learning objects in a wide variety of disciplines that can be downloaded freely for use in courses. Its 110,000-strong open membership also can access learning exercises, make contact with experts and colleagues across disciplines, and more.

Moving outside higher education, the What Works Clearinghouse at the US Department of Education's Institute of Education Sciences (IES) aims to facilitate practice-improving interventions in K–12 education. Like the database I envision here, it has clearly defined protocols and rules about what can be included and how the material should be described.

The AUQA Good Practice Database

The database (www.auqa.edu.au/gp/index.php) contains some 160 examples of good practice in the area of university operations relating to quality—including, importantly, the quality of teaching and learning.

An entry is defined as "a discrete system or activity that has been identified through the audit process of AUQA (or by another validating body) as adding commendable value for the institution/agency and its stakeholders, and that may be beneficially transferable to other organizational settings." Further, "these entries are not held to be 'best' practice, as that would require a competitive selection process that may impede the sharing of valuable practices. Rather, the philosophy of the Good Practice Database is simply one of sharing as many verified good practices as possible, for the overall benefit of the higher education sector."

The entries are arranged into 13 fully searchable categories. A posting by Carnegie Mellon University–Australia in mid-2011 illustrates the content. Entitled "Analysis and Use of Student Feedback," it contains a short section describing the activity's goal, another describing its context, a longer section describing the practice itself, two sections about the evidence used to gauge success, and a final section describing the resources required for implementation.

At only two–three pages in length, the posting represents an abstract rather than a detailed description; however, it includes contact details for the appropriate person at the university, and users are encouraged to follow up. The database attracted more than 150,000 hits between its inception circa 2003 and the merger of AUQA into the (Australian) Tertiary Education and Standards Agency (TEQSA) in 2011.

Although multiple good practices databases could be created, a single national database would offer a number of advantages. For instance, good practices do not respect state or disciplinary boundaries, and the need to search multiple databases would be a deterrent to effective innovation. The good practices database will not be massive, and thus not extremely costly, or involve privacy issues that might raise "big brother" kinds of concerns. Hence, no clear reason exists why a national resource should not be created at the outset.

The National Governors Association's Center for Best Practices might be the natural home for this task, but the job also could be done by a foundation, the US Department of Education, or perhaps a new nongovernmental organization. Wherever located, the hosting organization would need to handle much more than information technology issues. These include developing and maintaining a process for obtaining and vetting new entries, publicizing and promoting database usage, and providing user support. The database will need curating to maintain its integrity and authority, which will become more important as the number of submitters and users grows.

Initiative 2: Establish one or more "Race to the Top" programs to accelerate the adoption of processes for productivity improvement and price moderation. Imagine that the United States has established its good practices database and that the database has been populated with a substantial number of entries. We might expect that this trove of information by itself could facilitate the adoption of cost-containment initiatives. Given the urgency of the problems facing higher education and the sector's traditional resistance to change, however, it may well be desirable to accelerate the rate of adoption. This can be done by a program that combines publicity about the possibilities for good-practice adoption with incentives for institutional transformation based on these practices. A good precedent for such a program already exists: the US Department of Education's Race to the Top initiative in elementary and secondary education.

The proposed Race to the Top-like program differs from the competition proposed by President Barack Obama in his 2012 State of the Union address, which focused on state financing of universities, aligning entry standards with K–12 education, and facilitating on-time completion. My initiative addresses a much broader set of issues and is based on the adoption of best practices rather than particular outcomes. It also would seek to attract a broader set of respondents: the states, of course, but also the senior governance elements of multicampus systems and even individual campuses.

This "race" should be aimed at eliciting transformational change in one or more of the best practice areas discussed above, or other areas with similar characteristics, rather than any particular set of outcomes. Achieving

such change at the system or campus level requires involvement of institutional leaders and governing boards because they are the only ones that can address systems, incentives, and accountability issues.

The Tennessee Board of Regents' adoption of academic audit for its 19-campus system in 2004 provides a good example of what can be accomplished.[4] The initiative, which arose within the systemwide administration and was backed strongly by the board, pushed the campuses to adopt best practices in teaching, learning, and assessment—without undermining their ability to innovate. Indeed, campus innovation was stimulated by the audit experience, a result that continues to this day. States can initiate similar programs, as I will discuss later. An additional advantage of starting at the state level is that laws and regulations can be adjusted as needed to enable the desired innovation. Indeed, the elementary-secondary Race to the Top required changes of this kind as a condition for applying.

The mechanics of the competition would be straightforward. The sponsoring entity organizes the program, invites applications, selects winners on a competitive basis, and provides them with grants or contracts. After a specified period of time, the sponsor follows up to make sure the plans have been implemented as agreed. The applicants would be state governments and higher education campuses and, where applicable, systems. Potential applicants would need to look no further than the good practices database for ideas about what to propose—although other kinds of innovations also would be welcome. A well-resourced Race to the Top–type program could elicit more transformative projects than the one-off projects typically undertaken with grant funding.

While the US Department of Education is an obvious candidate for sponsorship, the task could be handled by foundations or individual states. (Unlike the database, there is no overwhelming advantage in having a national program from the outset.) Although program scope remains to be determined, it is likely that the funds needed to induce institutions to undertake process innovations would be relatively modest compared to other investments in higher education.

Such a program has numerous advantages. For one, the "race" would distinguish itself from many of today's initiatives by requiring a commitment to embed the proposed activities in the operational fabric of the institution, with commensurate levels of cost sharing between the recipient and the sponsoring agency, rather than proceeding on a tentative or trial basis with mostly incremental money. (The operant rule might be to fund the short-term costs of transformation, perhaps with a "sweetener" to reward key participants, while requiring the receiving entity to embed the ongoing cost in its base budget to avoid creating a funding cliff at the end of the grant period.)

Cultivating a public connection between good cost-containment practices and campus prestige would be another program goal. A related advantage is that, as in the elementary and secondary experience, applicants would become familiar with cost-containment methodologies and might choose to implement them independently even if they do not succeed in the competition.

Whatever the details of this program, it will be important to deploy methods for verifying that the envisioned innovations have in fact been successfully embedded and are working as planned. This can be accomplished using a process audit, as described in the next section. In addition to delivering direct benefits, such use will provide a good developmental and demonstration platform for extending the audit methodology across the domains of productivity improvement and price moderation. And as part of the final project report, each winning recipient should write up the elements of good practice that have proven effective. These reviews would then be submitted to the good practices database.

Initiative 3: States, the federal government, foundations, higher education associations, and the media should mount concerted efforts to educate their constituents and the general public about the deeper issues involved in cost containment and how campuses' adoption of good practices is necessary for achieving it. The prerequisite for widespread adoption of good-practice initiatives is that institutions and their stakeholders have a broad and deep understanding about the approaches to cost containment and why they are important. Although some understanding exists already, it is not broad or deep enough to provide the needed impetus for change.

The key points to be made are (1) productivity improvement is in fact possible in higher education; (2) such improvement is a necessary condition for price moderation in most institutions, especially those that have sustained major reductions in state funding; (3) care must be taken to sustain quality when containing or cutting cost; and (4) translating productivity improvements into price moderation requires explicit policies for doing so, lest too many of the benefits be taken out in ways that do not benefit students or their parents.

There are many good candidates for this activity, and a wealth of potential content is available. Indeed, significant initiatives are underway already. For example,

an initiative being undertaken by WGBH (Boston public television) and the Forum for the Future of Higher Education provides an opportunity to educate the public about cost containment and how it relates to affordability.[5] The Ad Council, with its capacity for broad public outreach, might also be asked to play a role given the tremendous importance of the issues.

What might be helpful at this stage is a national workshop or conference to agree on a core message that many different actors could incorporate into their programs as appropriate to their missions and constraints. Although the exact content would of course have to be determined, the idea that price moderation will require *both* cost containment and a willingness on the part of institutions to pass part of the savings along to consumers rather than spending all of them on cross subsidies would seem to be an essential part of the program.

Initiative 4: Organizations within and outside traditional higher education should develop training and certification programs on good cost-containment practice and process-audit methodology. Institutional leaders should value such certifications and make sure that a critical mass of people in their areas have demonstrated the necessary skills and abilities. Enhancing university personnel's understanding about ways to contain cost is another prerequisite for serious progress. Many institutions have made great strides in improving faculty teaching skills, and many faculty and staff are excellent innovators in their areas of expertise. However, far less knowledge has been amassed about how to organize the larger-scale efforts needed to create and sustain systemic change in the face of organizational inertia. Campus programs to improve teaching need to be accelerated and expanded to include the kinds of good practices considered in this paper.

The online Graduate Certificate in (academic) Quality Assurance (GCQA) offered by the LH Martin Institute at the University of Melbourne is a model of an externally run program. Another model is the training the National Center for Academic Transformation provides as an important element in its course redesign program—which has the avowed goal of building a cadre of experienced redesigners within each institution it touches. It would not be difficult for a university, professional association, or other entity to mount a program that covers all the concepts relevant to cost containment. Launching such a program would be well within the capacity of most such providers, and given reasonable public awareness, there is every reason to believe it could sustain itself in the marketplace.

The world of business quality assurance and productivity improvement offers a plethora of examples. Perhaps best known are the International Organization for Standardization (ISO) and Six Sigma certification programs. For example, a Black Belt in Six Sigma certifies that the recipient has mastered a body of principles and processes (some of which are quite complex) and has demonstrated the ability to apply them in practice.[6] Green and Yellow Belts certify lesser degrees of mastery and experience. A variety of providers offer the certifications, many accredited by the International Association for Six Sigma Certification. They are highly sought by participants and significantly valued by hiring officers.

Six Sigma demonstrates that training and certification generates its own impetus for change. Trained cadres within organizations find many more opportunities for effecting improvement than people, even highly motivated people, who lack such training. Success breeds on itself, and in time the organization's culture changes to the point to which failure to continuously improve is a cause for disappointment and prompt remedial action.

Process Audits

There is a saying in the quality movement that "if you can't measure something, you can't improve it." The obvious corollary is that one cannot hold people accountable for things that cannot be evaluated. This presents good and bad news for cost containment. The good news is that methods for measuring process performance are readily at hand. The bad news, that they are seldom applied in higher education, leads to the following:

Initiative 5: Undertake an immediate effort to develop protocols and procedures for auditing university productivity improvement and price moderation processes. The audits should be designed to enable accountability and simultaneously stimulate improvement. At its root, process auditing means talking with people at various levels in the institution about what they are doing and how. The mechanics are similar to those of accreditation and program review: a self-study, a visit by the audit team, and a report of audit findings. However, the audit focuses on the necessary and sufficient conditions for producing desirable outcomes, which are relatively easy to observe and evaluate, rather than the outcomes themselves, which are much more difficult to evaluate. For example, departments that work collaboratively to achieve clear educational goals informed by consultation with employers and

other stakeholders, carefully design their teaching methods in light of the best available scientific evidence about learning, measure their performance using state-of-the art student assessment protocols that are well-aligned with the goals, and strive to continuously improve their performance will produce better outcomes than those that do little or nothing along these lines.

Audits are conducted by teams whose members have a working knowledge of best practices and have been trained to ask process-related questions. And because the answers sought are mainly descriptions of what respondents are actually doing, there is no need for broad generalizations or special studies—which are both expensive and prone to puffing and spinning.

The very good people in traditional higher education are mired in processes that are both insufficiently effective and difficult to change.

Auditing differs substantially from program review and the traditional approaches to accreditation, which focus on governance; resource adequacy; and, to the extent possible, the delivered quality of education and research. These things are very important, but they tell us little about the link between resources and outcomes: how the resources are used in the production of outcomes.

The very good people in traditional higher education are mired in processes that are both insufficiently effective and difficult to change. Auditing is ideally suited for determining whether needed changes have been implemented on particular campuses—a determination that is key to an effective race to the top for higher education productivity and to the kinds of governmental policies I will discuss later. Some of today's accreditors are addressing these issues with forms of process auditing, but practice varies substantially from region to region and field to field. Real progress will not be possible until the adoption of good practices can be monitored across the system with process audits that are purpose-designed and comparable across institutions, fields, and regions.

One question often arises at this point in the discussion of audits: why not just hold institutions accountable through the use of outcome metrics? The short answer is that even the best-designed outcome metrics will not tell us what we need to know about the adoption of best practices. Box 2 illustrates why. It uses graduation rate as an example, but the same reasoning applies to most if not all outcome metrics.

The lesson is that, by themselves, outcome metrics do not have the resolving power needed to answer questions about assignable causes. Quality experts like W. Edwards Deming remind us that one cannot "inspect" quality into a product or service at the end of a process: one needs "profound knowledge" about the process, what causes variation in quality, and what can be done by way of improvement.[7] Unfortunately, one cannot take for granted that profound knowledge about teaching and learning processes, as opposed to disciplinary content, is available and accepted in most academic departments.

This point does not say that outcomes metrics should not be used (they clearly should be) but, rather, that in the present context they should not be used exclusively. Exclusive reliance may be sufficient in situations where the assignable causes of metrics' variations, and the kinds of mitigations that generally prove effective in dealing with them, are embedded in the organization's culture. The current higher education situation is different in that process innovation needs to take place in contexts where the knowledge and cultural underpinnings for such changes are largely lacking. The so-called student assessment movement showed that calls for change, however urgent and often repeated, do not by themselves produce the desired outcomes—even when the results are inherently measurable.[8] Near-exclusive reliance on outcomes metrics may be appropriate in some areas once the efficacy of good practices is firmly established, but they are not sufficient during the transition period.

A second question is whether process auditing would constrain institutions in a straitjacket of externally imposed specifications. The answer is emphatically no. The goal is that institutions develop appropriate processes for productivity improvement and price moderation and then are diligent in their application. "Appropriate" in this context means following certain principles that have proven effective—for example, that the processes be outcomes-focused, evidence-based, coherent, collaborative, rooted in best practice, and subject to continuous improvement.[9] Additional principles can be derived from learning science, service science, academic systems analysis, business process reengineering, and what author Tim Brown calls "design thinking": addressing improvement holistically, systematically, and in an evidence-based way, rather than traditionally, intuitively, and anecdotally.[10]

Supplementing Outcome Metrics with a Process Audit

Graduation rate is a popular output metric, but using it exclusively raises two kinds of issues: (1) getting the definition right and (2) interpreting results. Definitional errors, like not taking proper account of part-time students, can seriously distort both incentives and accountability.

The interpretation difficulties are even more formidable: for example, is an uptake due to better teaching and learning or an admissions shift toward students who are more likely to finish? Conversely, remedial actions can take a long time to manifest themselves. For example, reengineering key freshman courses to improve learning or using systems analysis to remove early bottlenecks will take several years to move the graduation rate, and even then the results may be swamped by other variables.

Process auditing cuts through these difficulties by looking for assignable causes of changes in the metrics. The auditors will have no difficulty determining that courses have been reengineered or that bottleneck questions are being addressed and calculating the effect of these actions on pass rates and progression. Failure to observe any such actions, or any other actions known to improve graduation rates, will indicate that areas of improvement remain to be exploited. Moreover, the audit itself will inform the institution and its faculty about good practices that ought to be adopted.

How the principles are applied to practice must be a matter for local decision makers, but the auditors will be interested in whether the institution puts a high priority on process design and improvement—as opposed, say, to letting each teacher do things as he or she sees fit at the moment, without regard to principles or best practices. Although a laissez-faire approach is sometimes justified on grounds of "academic freedom," its real effect is to block organizational learning and thus reinforce the status quo, which is not at all what academic freedom is intended to achieve. There is an analogy here to financial audits, where management has decision-making discretion within the tenets of generally accepted accounting principles. The principles do not require issues to be decided in particular ways, but they do provide guidelines and, in particular, call out kinds of actions that auditors will find objectionable.

So far most process audits in higher education have been of the academic variety. These are targeted to quality improvement and assurance,[11] but no reason exists for why the methodology cannot be extended to all processes that are important for cost containment. The audits conducted by the AUQA between 2000 and 2012 can serve as a starting point for this extension. In addition to assessing academic quality processes, they also address incentives for individuals and departments, faculty training and evaluation, the teaching-research balance, resource allocation, and other productivity-related matters. Process audits conducted by agencies like AUQA usually cover the campus as a whole, but experience has shown that they must include drilling down to department and school processes, as well as those run by the central administration.[12] Understanding what is happening at the grassroots level is essential for reaching judgments about the effectiveness of the overarching campus programs.

Auditing is both less intrusive and more reliable than conventional evaluations. The lighter touch stems from its focus on things auditees do or should do regularly anyway, rather than requiring special documentation, analysis, and justification. Reliability comes from the fact that it is hard for respondents to spin the evidence: familiarity with and commitment to processes will generally be self-evident to skilled auditors, as will efforts to get by on lip service. Moreover, the informed conversations that take place in an audit stimulate learning by both the auditor and auditee, while talking with a respondent who is not doing very much can be the first step toward improvement.

Process audit findings are inherently subjective, but rubrics have been developed for describing the results systematically. For instance, in my audits of Hong Kong's universities, I applied a rubric adapted from the Capability Maturity Model[13] developed at Carnegie Mellon University to track the prowess of advanced software development teams:

- *No effort.* The group of individuals (unit) being studied asserts little responsibility for the desired outcomes and does not have systematic processes for achieving them. Outcomes are largely unmonitored and approached mostly in traditional ways.

- *Firefighting.* The unit responds to problems, but mostly with ad hoc methods. The target areas of activity are not covered systematically, and process principles receive little attention.

- *Informal effort.* Individual respondents experiment with the principles, but few colleagues pay much attention. Coverage of the target areas remains spotty, and the unit has yet to become a learning organization with respect to the principles.

- *Organized effort.* Units plan and track process initiatives in all the target areas. Emergent norms encourage consideration of the process principles, and methods for gauging performance are under development.

- *Mature effort.* The principles have become embedded in the unit's culture, and the idea of regular improvement in all targeted areas is a well-accepted way of life. The unit has accepted planning, tracking, and performance evaluation for the target areas as important elements of peer and institutional accountability, and it has developed effective methods for doing so.

Among other things, the rubrics' descriptive phrases are designed to be meaningful to a broad audience and thus to provide an impetus for public accountability.

State and Federal Policies

So far campus adoption of good cost-containment practices has been mostly voluntary. Although much can be said for such self-initiated efforts, most schools still view productivity-improving and price-moderating activities as peripheral to their mainline academic work. And because these activities are peripheral, the progress toward fundamental change—reinventing the traditional university—remains small.

Governments can seek to influence the activities of universities in three ways.[14] The first is by direct regulation: detailed prescriptions about what the institutions can and cannot do. Many such regulations have been promulgated over the years and, except for the most basic ones like licensure and prevention of fraud in the use of public monies, they generally are not regarded as successful. The use of direct regulation can hamstring an institution's ability to respond to market forces, inhibit innovation, and incur large transaction costs—not to mention being relatively ineffectual in achieving the desired results.

The second approach attempts to micromanage the market by using formula-based financial incentives to induce desired behavior—for example, funding based on the number of students attaining degrees or certificates. Formula-based incentives provide many advantages as compared to direct regulation, but difficulties remain. It is hard to tune the formulas to achieve the desired result while avoiding unintended consequences, and the formulas are hard to change once institutions have come to rely on them.

The third approach, which might be viewed as the application of "soft power" as opposed to the "hard power" of regulations and formulas, is to use a combination of persuasion and judgment-based sanctions and incentives to move institutions in desired directions while continuing to recognize inexorable marketplace realities. Success with this approach depends on clear expectations and unequivocal performance assessments based on judgments by competent individuals and groups without conflicts of interest. Most of the proposals listed below fall into this third category.

Initiatives for State Governments. State governments have two unique areas of opportunity for furthering the cost containment agenda in their public institutions: (1) setting clear expectations and insisting on their achievement and (2) using process auditing to evaluate institutional performance. Once those two objectives have been attained, the force of public opinion and, where appropriate, financial incentives and disincentives can be used to push the process forward in the face of internal resistance and contrary market forces. (Such an agenda would complement current efforts by the National Governors Association to develop accountability mechanisms for cost containment.) The following initiatives are aimed at furthering this agenda.

Initiative 6: Make the successful adoption of cost containment processes a widely publicized key results area for university board members and officers, and insist that they vigorously apply the governance and management tools at their disposal to achieve these ends. The idea of leaning against the market—for example, by holding the line on prices—is well-grounded in the economic theory of nonprofit enterprises. According to the theory, nonprofit entities including universities are intended, indeed obligated, to maximize mission attainment subject to constraints imposed by productivity, the marketplace, and financial

considerations.[15] This is not at all equivalent to the obligation of for-profit organizations to maximize shareholder value subject to productivity and market constraints. In other words, the nonprofit organizational form moves financial considerations from being the *objective*, as in for-profits, to being just another *constraint*. Nonprofit institutions that let financial considerations dominate mission are behaving like for-profits.

The question, then, comes down to defining mission. Without going into the details of governance (including the special role of faculty), it seems clear that the subsidies and tax benefits associated with university nonprofit status should give the public some say in mission determination. It also seems reasonable that cost containment should be in the mission-determining calculus. Hence, the state governments that own and subsidize the public universities should feel free to make cost containment a key results area. Although the universities' internal constituencies can legitimately question the use of hard power, given its potential for undermining academic integrity, this proposed use of soft power does not seem reasonable to oppose.

Understanding what is happening at the grassroots level is essential for reaching judgments about the effectiveness of the overarching campus programs.

What governance and management tools are available for achieving accountability? First, governors typically appoint university board members. If states are serious about containing costs, they will appoint regents and trustees who share that goal and then hold them publicly accountable for carrying it forward. Second, the board appoints university presidents. These appointments should reflect the board's priority of cost containment—indeed, getting a president who wholeheartedly shares this goal will be a litmus test for trustees and regents. Finally, cost containment and all its ramifications should remain a key result area for university presidents, with appropriate recognition in performance evaluation and compensation. Presidents should be expected to apply all available management tools to move the cost-containment agenda forward.

Nothing in this scheme violates the principle that board members should not meddle in the internal affairs of institutions. Providing public input on mission determination and then holding the president accountable for achieving the mission is an entirely appropriate, and indeed quintessential, board role.

Declaring something as a key results area without also instituting a methodology for tracking progress is a formula for failure. Hence, the states should consider the next initiative.

Initiative 7: Institute process audit programs for productivity improvement and price moderation that cover all public institutions. The audits should be performed by competent disinterested entities on a regular basis, with sufficient frequency to maintain attention and momentum. The results should be made public.

Placing process audits under the purview of state higher education executive officers, with appropriate accountability from the governor or legislature, would provide tools for their constructive engagement with institutions on an array of important issues—tools now lacking in many states. The audits themselves could be organized by the state higher education executive office or contracted out. International experience has shown that auditing campuses on a staggered five- or six-year cycle is sufficient, especially if institutions institute programs of internal process audit (itself a good practice) to provide their leaders with process visibility during the intervening years.

Many within higher education will likely argue against "yet another review mechanism," but such arguments are not at all compelling.[16] First, the degree of intrusion is low—it mostly involves talking to people about what they already are or should be doing. Second, experience overwhelmingly shows that the people involved in these discussions learn enough about how they can improve their activities to make the time commitment more worthwhile. (Furthermore, they tend to like the experience.) Finally, process audit programs are relatively inexpensive, especially considering the amount of investment being made in higher education and the importance of furthering the productivity, quality, and price moderation agenda. These advantages also commend the use of internal process audits. Indeed, some of the most successful applications of audits have been as internal management tools.

The last remaining question is how states can leverage the results of audits. The results should no doubt be

made public. They should be disseminated widely—which means the media, among other entities, should be attuned to the results and provided with the resources to discuss them in depth. Institutions should be allowed to comment on what they are doing and why, and informed public debate about their cost containment performance should be the order of the day. It also may be desirable to go further: for example, condition a small but material percentage of public universities' annual funding on the audit results. Methodological questions relating to the multiyear audit cycle would have to be worked out, but these are by no means showstoppers.[17]

There is a good argument for the federal government to withhold funds from institutions that cannot show they are trying to contain costs.

Proposals for the Federal Government. The federal government's role in higher education is distinctly limited compared to that of the states. Nevertheless, certain actions in support of the cost containment agenda can be taken only at the federal level. One such responsibility relates to the maintenance of national statistics and data systems.

Initiative 8: Follow up on the recommendations of the National Research Council's Panel on Improving Measurement of Productivity in Higher Education, and implement as many as possible as a matter of priority. Putting measurement of productivity in higher education on the same footing as it is in other industries will counter the view that such measurement is not feasible or important. This will help keep the cost containment issue in focus and enable informed conversation that hopefully will spur improvement. Also relevant here, the report calls for a national system of process audits to ensure that an increased emphasis on productivity does not undermine quality.[18] The panel believes the next step should be to create a federal task force for implementing its many recommendations.

The following is another initiative that the executive branch could undertake and that, in principle, should not prove controversial.

Initiative 9: Identify the impediments to college and university cost containment that are embedded in current federal policies and procedures, and propose mitigations. Three such mitigations come to mind immediately, and of course there may be others. First, there are the often-repeated complaints that universities are drowning in government-imposed red tape and that some requirements actually preclude what otherwise would be valid cost-saving initiatives. While many reporting and compliance requirements have been imposed for good and sufficient reasons, pruning and streamlining can no doubt pay dividends. Therefore, federal agencies should review their procedures with the objective of enabling campus cost-containment initiatives.

A second problem is that many, if not most, federal agencies that fund research press rigorously for institutional cost sharing on grants and contracts, either directly or by limiting overhead reimbursements. Some actions have been responses to alleged abuses in overhead calculations, and others stem from principled differences of opinion about whether research should be funded on an incremental or full-cost basis. However, many people believe the federal research agencies are simply stretching their research dollars: that is, they are behaving as monopsonists by exploiting their buying power in an increasingly competitive research market.[19]

But whatever their justification, the fact remains that these practices exert an upward pressure on tuition rates and a downward pressure on financial aid. Their immediate effect is on extant and would-be research universities, but although these are relatively small in number, they exert disproportionate influence in price determination. Such universities usually have higher tuition rates and more prestige than other schools, and the rising price umbrella they provide escalates prices across the whole sector.[20] Because government is part of the price escalation problem, one way to mitigate the escalation would be an executive order to fully fund both the direct and indirect costs of research projects except in special circumstances, thus limiting the requirement for cost sharing. This could be accomplished by topping up the government's research appropriations or by reducing the number of grants as needed to provide the full funding.

Another possible mitigation would be for Congress to pass an exception to the antitrust laws that allows colleges and universities to consult together about ways to limit prices in certain circumstances and perhaps even to agree upon ceilings for rates of increase. This need not extend to the practices found illegal in the so-called "overlap group" (a group of eight Ivy League schools and the Massachusetts Institute for Technology that met to discuss financial

aid so as to prevent the schools from outbidding each other[21]), since that group dealt with individual financial aid cases. However, it would provide a safe harbor for a carefully defined set of price-limiting activities. Although no guarantee exists that institutions would wish to limit their discretion in this way, it is not beyond the realm of possibility. For example, some university leaders already are concerned about the political and affordability implications of unrestrained price escalation and might be persuaded (and perhaps encouraged by state governments) to consult with one another about mitigations if they could do so without fear of legal liability.

The last initiative is likely to be more controversial than the others. However, it could also be the most powerful.

Initiative 10: Consider linking campuses' eligibility and reimbursement rates for federal student aid programs, and perhaps certain elements of the universities' tax exemption, to demonstrated commitment to productivity improvement and price moderation. The most straightforward implementation of this initiative would be to make institutional eligibility for student aid contingent upon maintaining a satisfactory record on the process audits discussed earlier, just as such eligibility now depends on maintaining regional accreditation. Doing so would require audit coverage for the whole nation. This does not exist now but hopefully will improve over time, especially if the federal government throws its weight behind the idea.

Another possibility would be to require institutions that fail to demonstrate cost containment commitment to fund a portion of federally sponsored grants or loans received by their students. A variation on this theme would be to apply some kind of excise tax on gifts or endowment returns to institutions that consistently fail process audits. Finally, of course, the more extreme approach is linking financial provision and penalties to the actual rate of increase of tuition. Such an action could have unexpected negative consequences, but simply considering it might stimulate other steps for effecting cost containment.

President Obama, in his 2012 State of the Union address, proposed linking tuition rises and federal student aid payments, but that idea went nowhere. The proposal I have presented is considerably softer than Obama's, and it might prove to be more acceptable for that reason. Moreover, there is a good argument for the federal government to withhold funds from institutions that cannot show they are trying to contain costs. Although optimism about political feasibility would certainly be misplaced, the list of possibilities for federal action would not be complete without including this kind of initiative.[22]

Concluding Comment

Like most economists, I believe in the unique power of markets to integrate the needs and wants of economic actors, balance supply and demand, and overcome organizational inertia to allocate resources efficiently. However, markets need good information if they are to function effectively—information that is sorely lacking in the market for undergraduate credits and degrees.

Action must be rooted in campus adoption of good practices despite internal pushback and today's imperfect marketplace.

The problem arises because today's metrics for adding value to learning are not good enough to support the tradeoffs between quality and price needed for market efficiency. Because information on these tradeoffs is not available, competition too often focuses on prestige and other quality surrogates that drive up prices rather than discipline them. To complete the vicious circle, the lack of downward pricing pressure reduces the impetus for productivity improvement, which opens the way to cost rises that justify further price increases.

Despite these difficulties, the cost of higher education is not beyond our reach: it can, in fact, be attacked proactively in ways that are likely to prove fruitful. The action must be rooted in campus adoption of good practices despite internal pushback and today's imperfect marketplace. Some people may prefer a strategy of watchful waiting, hoping that institutions will move on their own accord and thus avoid the necessity for external intervention, but the cultural and marketplace barriers to effective action are so formidable that little progress can be expected any time soon. That is why I have focused on initiatives that entities external to the campus can take to overcome these barriers and restore the curative powers of the marketplace.

Appendix: Proven and Emergent Good-Practice Areas

Productivity-Improving Initiatives

1. *Course Redesign.* This is a systematic process in which the activities, resource utilization, and quality metrics for a particular course are analyzed in detail and then tested for possibilities of improvement in cost, quality, or both. Teams of faculty with responsibility for teaching a course typically undertake the redesign, often with the aid of consultants.[23] The approach involves organizing the teaching tasks into small bundles, costing out the bundles, and then finding ways to restructure them into configurations deemed likely to be more cost effective. Good redesign requires accepted and well-understood course objectives and appropriate metrics for assessing student learning against the objectives, lest the proposed changes end up eroding quality. A significant number of institutions have redesigned their courses with excellent results—results that often, but not always, involve the use of technology.

2. *Advanced Technology Applications.* The long-heralded promise of technology for transforming higher education appears finally to be coming to fruition.[24] Many institutions are offering online courses, degrees, and certificates. Perhaps more fundamental to the transformation agenda, however, are the revolutions in on-campus and distance learning offered by "learning objects": independently operable software modules that provide facts and concepts and also engage the student in active learning behavior and assess his or her performance. Carnegie-Mellon University's Open Learning Initiative, funded by the Hewlett Foundation and others, has made great progress in developing such resources, and campuses such as the University of Minnesota–Rochester have adopted them wholesale for their programs.[25]

   It is reported that the University of Phoenix and at least one other large for-profit university are engaged in major development activities based on integrated collections of learning objects. Most recently, the MOOCs are demonstrating that this technology can work effectively at huge scales. (The main problem that remains to be solved is that of grading, but this appears solvable with more advanced software, perhaps using the rubrics concept discussed in number 6.) The technology no doubt can and will transform teaching in those traditional universities that are nimble enough to apply it, and disruptive competition from the MOOCs, for-profits, and others will force the issue.

3. *Application of Learning Sciences.* Rooted in cognition and psychology, learning science is dramatically improving our understanding of how learning takes place—or fails to take place—and the ways that learning events can be improved for maximum effectiveness.[26] Many learning-science principles are well known (though too often ignored in practice): for example, meaningful engagement, goal-directed practice and targeted feedback are necessary for deep learning. Others are more surprising: for example, that prior knowledge can hinder as well as help learning, the way students organize knowledge is a major determinant of how they use it, and students must learn to monitor, evaluate, and adjust their approaches to learning if they are to become self-directed learners.

   The implications of learning science include: (1) instructors should take the time to acquire relevant knowledge about their students and use that knowledge to inform course design and classroom teaching; (2) the knowledge and skills to be taught should be carefully prioritized lest learning be inhabited by a confused jumble of facts; and perhaps most important of all, (3) teachers should recognize and overcome their expert blind spots. I predict that, as experience accumulates, more and more professors will master the principles of learning science and that, eventually, deep knowledge of the science will be taught in doctoral programs as a prerequisite for university-level teaching.

4. *Applications of Service Science.* The emergent field of service science recognizes that, to be fully effective, all service provision requires the sustained effort of receivers as well as suppliers—an idea called "coproduction."[27] The lessons of service science offer powerful insights about teaching and learning, in which it is widely acknowledged that students need to take proactive roles in their own education. They also apply to university administrative and support service operations, where faculty should work collaboratively with service providers to produce desired outcomes.

   Coproduction adds a significant degree of complexity to service delivery. Providers must ascertain the recipients' capacity to participate actively and their motivation to do so and then deploy processes

and incentives that facilitate the joint efforts. (This is consistent with learning-science principles.) Much college teaching shortchanges the requirements of coproduction, and the good practices database definitely should include examples where this and the other principles of coproduction are being applied successfully.

5. *Degree Qualifications Profile.* This tool for education quality improvement, now well along in development by the Lumina Foundation, lays out what "students should be expected to know and be able to do" once they have earned their degrees.[28] The proposals apply to associate, bachelor's, and master's degrees, regardless of the student's field of specialization. The tool addresses five basic areas of learning—broad, integrative knowledge; specialized knowledge; intellectual skills; applied learning; and civic learning—and invites students to demonstrate achievement at levels appropriate to the degree they seek. According to the Lumina Foundation, use of the profile over time should yield the following kinds of results: "(i) a common vocabulary for sharing good practice; (ii) a foundation for better public understanding of what institutions of higher education do; (iii) reference points for accountability that are far stronger than test scores or tallies of graduates, research dollars, research satisfaction ratings, job placements or patents."[29] The framework already is proving useful for developing the "rubric" metrics described in the next point, and it soon will be applied to enhancing academic audits.

6. *Learning Metrics.* A variety of groups have made much progress in recent years on the development of learning metrics. Examples include the Educational Testing Service's Measure of Academic Proficiency and Progress, ACT's Collegiate Assessment of Academic Proficiency, and the RAND Corporation and Council for Aid to Education's Collegiate Learning Assessment (CLA). Other outcome metrics can be obtained in some fields from results on licensure examinations, graduate school admission exams, and the like. Although not measuring output quality, the National Survey of Student Engagement and its community college counterpart provide important information about one of the key prerequisites for learning.[30]

   The most exciting current development is the one being undertaken by the American Association of Colleges and Universities with support from the Lumina Foundation.[31] The first step is for program-level faculty to develop rubrics that describe the kinds of skills and abilities they expect students to learn. (Lumina's Degree Qualifications Profile is proving useful in this regard.) The second step is to assess students using these rubrics—which, unlike the CLA and other tests, are tailored for each particular program. The third step, once students have demonstrated the concept, is for institutions to work with faculty to embed such rubrics in the grading for all or most of their high-volume courses: at which point the Holy Grail of broad-scale assessment with highly motivated students will be within reach.

7. *Academic Systems Analysis.* Academic systems analysis generalizes the idea of redesigning individual courses to look at the university's teaching and learning activities in systemic terms. Looking for the assignable causes of low completion rates falls under this rubric, as do analyzing faculty workloads and using adjunct and similar teachers. A promising new approach currently under development is to extract legacy-system data on the whole range of teaching activities for departments, schools, and the university and then use dashboards, control limits, and optimization techniques to identify exceptional situations and search for the best activity configurations given available resources.[32] The idea of systematic process analysis is rooted in the work of W. Edwards Deming, Joseph Juran, lean manufacturing, and Six Sigma certification concepts. However, it can be uniquely adapted to the situation in higher education, including traditional universities.

8. *Resource Utilization Models.* The question of how professors spend their time must be as old as the professoriate itself and as controversial as certain aspects of the academic value system. Best practice accepts as givens that that professorial duties include vastly more than student contact hours and that faculty do not punch time clocks. At the same time, however, such practice embraces databases for tracking faculty workloads in sufficient detail to be useful for policy purposes and not infrequently for individual counseling and evaluation. These practices recognize the inherent limits on professors' ability to parse their time for reporting on individual categories, and they provide user-friendly interfaces for reporting the data they can reasonably provide.

Well-designed systems do not generally meet overpowering resistance, though of course the culture of individual institutions may stand in the way of adoption. In a promising new development being tested in Australia, the concept of standard time allocations for activities faculty engage in repeatedly (based on in-depth studies of small samples of willing faculty) will be used to reduce the faculty's reporting burden.[33]

9. *Activity-Based Costing (ABC).* ABC studies go beyond traditional cost-accounting methods, which look at broad groups of activities (functions like instruction and research) and objects of expense (for example, salaries and benefits), to get at the cost of specific activities like those analyzed in the course redesign and systemic process analysis stages. Some traditional accounting firms apply ABC to higher education, but their methodology falls short in the sense that costs are allocated to groups of instructional activities rather than being built up from data on individual activities. Likewise, efforts to calculate the cost per credit hour and post cost per degree can be viewed as elementary forms of activity-based costing. The advent of systemic process analysis opens the way to a much more useful bottom-up form of ABC, albeit one that only a few institutions are currently trying.

10. *Business Process Reengineering (BPR).* Many institutions use BPR to improve productivity and service quality within administrative and support areas.[34] Like course redesign on the academic side, BPR looks in detail at the processes being used to produce particular outcomes and then seeks to find ways to improve them. (Until recently, it was regarded as the only form of process analysis applicable to colleges and universities.) Getting the full benefits of BPR requires more than simply episodic studies—rather it means a systematic program for reviewing and improving organizational areas on a regular basis. Although the current budget environment makes it difficult to invest in such programs (even though they are likely to pay off handsomely), the know-how for doing so undoubtedly already resides in many institutions.

Price Moderation Initiatives

11. *Public Disclosure of Learning Metrics and Processes.* Most commentators agree that the lack of good information about the quality of university learning and degrees spawns major imperfections in the higher education marketplaces. It follows that improvement in this regard would allow markets to discipline price (net tuition) the basis of delivered quality—especially if accompanied by serious efforts to educate students and their parents on the importance of quality and on how to interpret information about it. Any such improvement effort depends on the willingness and ability of institutions to collect the needed quality information and make it public. Further, because the quality metrics are disparate and difficult to interpret, disclosure of the processes by which quality is assured, measured, and improved will be of great help to the public and their surrogates in the media. Some accreditors have made progress along these lines, but institutional resistance has limited progress. Therefore, formulating and disclosing appropriate information about learning metrics and processes represents an important nexus of best practice.

12. *New Price-Setting Policies and Practices.* In addition to marketplace discipline, direct institutional action motivated by social responsibility should play an important role in mitigating price increases. Experience shows that the following policies and practices can be effective.[35] First, institutions should develop multiyear rolling financial plans that include tuition rates and financial aid allocations as key parameters. These parameters should be debated on the basis of social and political factors as well as the more traditional competitive ones and traded off against the school's financial needs and aspirations. Second, tuition and financial aid should be decided early in each year's budget process, with due regard to the financial plan, and then used as a constraint on subsequent spending decisions. This contrasts with the common process of using tuition, explicitly or implicitly, as the "plug factor" needed to balance the budget once spending needs and aspirations have been ascertained.

Notes

1. My views about the barriers, and what can be done about them, can be found in William F. Massy "Creative Paths to Boosting Academic Productivity," in *Reinventing the American University: The Promise of Innovation,* Ben Wildavsky, Andrew P. Kelly, and Kevin Cary (Cambridge, MA: Harvard Education Press, 2011), 73–100.

2. See for example, National Research Council (NRC), "Panel on Measuring Higher Education Productivity: Conceptual Framework and Data Needs" in *Improving Measurement of Productivity in Higher Education*, ed. T. A. Sullivan et al. (Washington, DC: The National Academies Press, 2012).

3. The materials in box 1 are from Australian Universities Quality Agency, AUQA Good Practice Database, www.auqa.edu.au/gp.

4. See William F. Massy, Stephen W. Graham, and Paula Myrick Short, *Academic Quality Work: A Handbook for Improvement* (San Francisco: Jossey Bass, 2007).

5. See Lumina Foundation, "Forum for the Future of Higher Education," grant #7937, www.luminafoundation.org/luminagrants /forum_for_the_future_of_higher_education_cambridge_ma/.

6. A popular yet authoritative description of Six Sigma, its benefits, and its certifications can be found in Craig Gygi, Bruce Williams, and Stephen R. Covey, *Six Sigma for Dummies*, 2nd ed. (New York: Wiley, 2012).

7. See for example, Rafael Aguayo, *Dr. Deming: The American Who Taught the Japanese about Quality* (New York: Simon & Schuster, 1990), chapter 11.

8. William F Massy, *Honoring the Trust: Quality and Cost Containment in Higher Education* (San Francisco: Jossey Bass, 2003), 214–17.

9. Massy, Graham, and Short, *Academic Quality Work,* chapter 3.

10. Tim Brown, *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation* (New York: Harper Collins, 2009). He also points out that because one must be careful not to "suck the life out of the creative process" by relying only on the rational and analytical, it is necessary to blend analytics with creativity to get a better result than is attainable with either alone.

11. Detailed descriptions of academic auditing and its applications can be found in Massy, Graham, and Short, *Academic Quality Work* and the references cited there.

12. Audits that focus strictly at the department level been conducted by the Tennessee Board of Regents, the University of Missouri System, and the subject-level accreditors the Association to Advance Collegiate Schools of Business, the Accreditation Board for Engineering and Technology, and the Teacher Education Accreditation Council. Institution-level audits, most with department-level sampling, have been conducted by the UK's Quality Assurance Agency, and Hong Kong's University Grants Committee, and, as noted in the text, the AUQA.

13. See the CMMI Institute for more information at http:// cmmiinstitute.com/.

14. See for example, Stephan A. Hoenack, *Economic Behavior within Organizations* (Cambridge, UK: Cambridge University Press, 1983).

15. See, for example, William F. Massy, "*Collegium economicum*: Why Institutions Do What They Do," *Change*, (July–August 2004): 27–35; and Massy, *Honoring the Trust*, chapter 2. Further discussion about the balance between values and market forces can be found in William F., Massy, "Academic Values and the Marketplace," *Higher Education Management and Policy* 21, no. 3 (September 2009): 1–16.

16. The arguments are summarized in Massy, Graham, and Short, *Academic Quality Work*, chapter 2.

17. For example, the reward for a good result could persist through the audit cycle, whereas the penalty for a poor one might be at least partly remediable after a year or two if the institution presents appropriate evidence of improvement.

18. National Research Council, "Panel on Measuring Higher Education Productivity," summarized in William F. Massy, Teresa A. Sullivan, and Christopher Mackie, "Data Needed for Improving Productivity Measurement in Higher Education," *Research and Practice in Assessment* 7, no. 2 (Winter 2012): 5–15.

19. One can argue that the government's buying power is enabled by overproduction of PhD students, which produces more claimants for its limited research appropriations. See for example, Charles Goldman and William F. Massy, *PhD Factory: Training and Employment of PhDs in Science and Engineering in the United States* (San Francisco: Jossey-Bass, 2000).

20. The key arguments are summarized in William F. Massy, "Cost and Pricing in Higher Education," in Helen F. Ladd and Edward B. Fiske, *Handbook of Research in Educational Finance and Policy* (New York: Taylor & Francis, 2007), 671–87.

21. See, for example, William A. Kaplan and Barbara A. Lee, *The Law of Higher Education*, 4th ed. (San Francisco: Jossey-Bass/Wiley, 2011), 1372.

22. Among other things, his proposal for the reform of American's accreditation system addresses the need expressed in this paper for detailed and nationally comparable information on institutional processes for the assurance and continuous improvement of teaching, learning, and assessment.

23. The best-known consultant on course redesign is Carol Twigg of the National Center for Academic Transformation; see Carol A. Twigg, "Improving Quality and Reducing Costs: the Case for Redesign," Lumina Foundation, 2005, 46, 48. See also William F. Massy and Robert Zemsky, "Using Information Technology to Enhance Academic Productivity" (Washington DC: Educom, Occasional Paper, 1995) and Jack M. Wilson, "Reengineering the Undergraduate Curriculum," in *The Learning Revolution: The Challenge of Information Technology in the Academy*, ed. D. G. Oblinger and S. C. Rush (San Francisco: Jossey-Bass, 1996), 107–28, for earlier accounts of the approach.

24. A good example of such a prediction can be found in "Technology's Misunderstood Potential," chapter 5 of Massy, *Honoring the Trust.*

25. For an accessible account of the early experience at UMR, and also the application of learning science, see Robert Zemsky, *Making Reform Work: The Case for Transforming American Higher Education* (New Brunswick, NJ: Rutgers University Press, 2009), chapters 9 and 10.

26. Candace Thille and her colleagues at Carnegie Mellon University have made major breakthroughs.

27. See Paul T. Magilo, Cheryl A. Kieliszewski, and James C. Spohrer (Eds.), *Handbook of Service Science* (New York: Springer, 2010).

28. Cliff Adelman et al., *The Degree Qualifications Profile: Defining Degrees: A New Direction for American Higher Education to Be Tested and Developed in Partnership with Faculty, Students, Leaders and Stakeholders* (Indianapolis, IN: Lumina Foundation, 2011), www.luminafoundation.org/publications/The_Degree_Qualifications_Profile.pdf.

29. Ibid, 2.

30. See NRC, "Panel on Measuring Higher Education Productivity," chapter 3, for a summary assessment of the state of the art and its implications for productivity measurement.

31. Communication by Debra Humphreys, AACU's vice president for communications and public affairs.

32. See William F. Massy, "Modeling Instructional Productivity in Traditional Universities," self-published working paper, 2012. The model is being piloted tested on two large university campuses.

33. Deborah Thomas, "Containing Teaching Costs and Increasing Productivity in a Faculty: Design and Implementation of a Workload Allocation Model" (unpublished master's thesis at the Faculty of Education, University of Melbourne, 2012).

34. Michael Hammer and James Champy, *Reengineering the Corporation: A Manifesto for Business Revolution* (New York: Harper Business, 1993).

35. I implemented such policies, with the enthusiastic support of the president and trustees, during my tenure in the 1980s as Stanford University's vice president for business and finance.