Culture warriors paralyzed their most easily labeled antagonists in the academy—the humanities faculty whose traditions had for centuries subordinated market forces to human welfare in the broad sense. The culture wars were so effective at normalizing market precepts that as public universities struggled in the early 1990s and early 2000s and lost ground to their private counterparts, a new financial language appeared on campus without debate or even an interpretive framework that would help to understand its effects.

The Looming of Finance

Following the California state budget squeeze of 1993 and 1994, University of California senior vice president for business and finance V. Wayne Kennedy linked the success of the university’s public mission to better financial management:

Recognizing that faithful stewardship of the public’s investment in the University of California is a top priority for our administration, the university is strengthening its business focus and is now in the second year of an ambitious program to overhaul and update its business practices with the expressed goal of enhancing institutional accountability. We are strengthening our system of controls as we continue to evaluate and redesign the university’s fundamental business processes. We are replacing outdated business systems and practices with methods comparable to those utilized by the nation’s leading corporations.¹

Using terms that had become common during Governor Pete Wilson’s administration, Kennedy redefined the university’s constitutional status of
“public trust” as a “public investment.” The production of value depended in some large part on a “business focus.” Business focus boiled down to more economical forms of financial supervision. Although the “business” of the university was knowledge, the university’s financial systems came to loom alongside research results as an index of quality. Financial accounting became a language of public explanation, and it was certainly more accessible than that of expert peer review.

Most universities gradually improved their accounting systems over the 1990s. They used better computer systems to automate information collection that was still done by hand, enhanced inventory tracking, and generally upgraded computer hardware and software to allow for something closer to real-time monitoring of cash flows. The quantity and quality of financial information seem generally to have improved. How much money these improvements actually saved is less clear. The University of California administration was in the unusual situation of having attracted the critical attention of a tireless, quantitatively oriented, retired physics professor from its Berkeley campus, Charles Schwartz. In a long series of 1990s papers that scrutinized the university’s public budgets for administrative costs, Schwartz was unable to detect savings. To the contrary, he found that administrative costs grew even during the period of budget cuts.

National trends showed the same pattern. Administrative costs and personnel grew steadily in good times and bad, and certainly at a higher rate than the growth of faculty. A 1990 study found that “the category of ‘other professionals’—academic support personnel filling such roles as financial aid counselors, auditors, research specialists, and systems analysts—had increased by more than 60 percent between 1975 and 1985, a period during which the size of the average faculty increased by less than 6 percent.” Another study found that in the twenty-five-year period between 1976 and 2001, “administrative staff employment in colleges and universities increased substantially, by about 50.1%. During the same period, the employment of non-faculty professionals mushroomed by a whopping 239.3%—that is, at a much faster rate than that of the faculty (75.8%) and of teaching and research assistants (about 63.1%).” Whatever else new management theory was doing on campus, it was not saving money by simplifying administration and reducing staff.

If the categorical statements about the value of business methods were not designed primarily to cut costs, what were they doing? They had a rhetorical dimension, of course, since nods to business were by the 1990s
generally taken as mandatory proof of a cooperative attitude toward society’s leading members. It is useful to think of finance as a symbolic system among other things, a prestigious language for explaining university operations to the outside world. The primary audience in this outside world was the business and political leadership that also spoke the language of finance, and that looked for financial returns on investments of public and private money alike. This leadership also recognized in the language of finance this symbolism of outreach to its own perspectives and interests.

Financial accounting was not a restraint on growth but a definer of growth, one that defined meaningful growth in financial terms. Much of the growth at universities in this period derived from two factors. The first was mission creep. Universities took on many new tasks, most of them not directly educational. Many involved financing, notably the expansion of private fund-raising, especially at public universities, into a permanent, large-scale campaign that came to take up much of the time of the academic administration. A second factor consisted of responses to new external rules. These two functions developed symbiotically, since much of the compliance to outside agencies involved the monitoring of the new money operations. Summarizing the explosion of reporting requirements coming from public commissions of higher education, legislators, boards of trustees, state and federal agencies, and the like, one set of veteran experts concluded that “the result again was more paper, more reporting, and, not surprisingly, more personnel, some of whom were charged with explaining to governing boards just why administrative costs were increasing at such an alarming rate.”

There is thus much reason to believe that corporate methods were not only ends in themselves but also a means of tightening the university’s dependence on outside agencies. Educational leaders had lamented this dependence in the 1950s and 1960s in relation to the federal government. The same issue was becoming more acute in relation to industrial sponsors. The culture wars, with their relentless attacks on nonmarket values, helped many participants to feel that these changes were not only inevitable but progressive.

The Evolution of Financial Influence

An interest in rationalizing academic management was hardly new in the 1990s. In the early 1900s, some academic leaders had thought that Frederick Taylor’s scientific management could be applied to the unruly university.
After World War II, business was remodeling itself along the lines that the sociologist Neil Fligstein described as the “financial conception of control.” Financial measures tended to supercede other estimates of a company’s status—strong product development, institutional stability, marketing innovation, community relations, and so on. In the 1980s, the rise of the “leveraged buyout”—in which a small company uses money borrowed at high interest rates to take over a much larger one—hinged on the commodification of the firm itself, which was treated as a product that could be bought, sold, divided up, and resold like suburban farmland or a truckload of firewood. Financial measures became more elaborate, accurate, comprehensive, and instantaneous, and came to play an ever larger role in the strategic planning and operations management of American companies. They tended to become the final judge of the quality of both the company and its management decisions: the value of a CEO was and still is readily and popularly measured by his or her impact on the company share price. Many such measures were obviously not relevant to the university as such, but as financial performance gained in status and influence, it came to loom larger in university administration.

There was one area in particular where it was easy to tell the story of the university as the story of money, and that was the school endowment. During the 1990s, most endowments enjoyed many years of double-digit growth: in fiscal year (FY) 1999, growth averaged 11 percent, and in FY 2000, the decade ended on a strong note with 13 percent average growth. It was impossible for administrators not to be a little preoccupied with growth like this, which seemed to make many new things possible.

University endowments also reflected the decade’s growth in economic inequality. The wealthiest endowments tended to do the best: endowments worth more than $1 billion in FY 2000 grew not at 13 percent but at 29.2 percent. In contrast, endowments valued at $100 million or less grew that year at less than one-third the rate of the majors. Harvard had the biggest endowment at the end of FY 2000 ($18.8 billion) and also a very large growth rate of 32.2 percent. Duke University and Notre Dame’s endowments grew 59 percent that year. On the whole, the richest got richer faster than everyone else. Business Week noted that in 2003, “just 20 institutions received $6.2 billion, or more than a quarter of all higher ed donations.” They correctly concluded that private fund-raising “exacerbates the inequality gap between the mostly affluent students who attend the elite schools and the middle-class and poor ones who mostly enroll in less prestigious ones.”
The secret of the biggest growth was private placements with venture capital firms.\textsuperscript{11} "These arrangements required that university fund managers be as sophisticated as their Wall Street peers. They also required secrecy about investment strategies, which were closely held proprietary information generally developed at arm's length from the administration and certainly from students and faculty. The only workable form of oversight over investments was financial accounting. The returns were easy to see, and the managers of endowments at Harvard, Yale, and elsewhere became stars in the investment world.\textsuperscript{12} Their endowments had little to do with campus culture, and had become more than ever a part of Wall Street culture.\textsuperscript{13} This influence was not linear: the university’s interest in endowment returns that thrashed market averages did not directly determine labor and other administrative policies. But the pronouncedly antiunion positions of major universities during the 1990s certainly resonated with conventional Wall Street wisdom about the tie between the strict minimization of present and future labor costs and the value of an enterprise in the eyes of investors. Administrative cultures deselected people who could not work well with the world outside the university, meaning with the business and financial leaders who were taking an active role in academic affairs. Such matters as union negotiations were seen as a net drain that could only interfere with the positive gains of investment management. With endowments, size did matter, and it mattered more and more as public funds were inexorably scaled back all over the country. Critics did note that endowment size did not necessarily correlate with educational quality, but size did not obviously hurt educational quality and in any case became more urgent as education leaders came to conclude that 1960s or even 1980s levels of public support for higher education were gone for good.\textsuperscript{14}

In addition to intensifying investment management, university administrators, who had lost confidence in the stability of both state and federal funding, became increasingly interested in raising private funds. They committed more university resources to expanding development offices. Development officers went donor hunting all across their alumni base, their local business community, and even their own campuses. English professors began to have the strange experience of being asked to meet with development people who would describe them as hidden assets in the university’s fund-raising agenda. The UC flagship campuses at Berkeley and Los Angeles announced capital campaigns of more than $1 billion apiece, and competed for the private contributions that at one time had gone largely to
private universities, many of them small and poorly endowed. Public universities announced a lengthening sequence of billion-dollar endowment campaigns, which by the 2000s included the University of Pittsburgh ($1 billion by 2007), the University of Missouri at Columbia ($1 billion by 2008), the University of Iowa ($1 billion by 2005), the University of California at San Diego ($1 billion by 2007), along with larger campaigns at more senior public flagships (half of the twenty-one in the billion-dollar sweepstakes were public).

Fund-raising brought new waves of wealthy potential donors onto campus and made their interests, viewpoints, and concerns central to the academic enterprise. A donor might have a special interest in an autism clinic, or terrorism studies, or global environmental management, or soft functional materials, and his or her donation could create a new program where none had previously been desired or planned. Usually these investments were in important areas, and university officials conducted careful and skillful dialogues with potential donors to help match their interests with existing academic needs. There were also boondoggles, like the financier T. Boone Pickens’s $165 million gift to Oklahoma State University for athletic facilities. In such cases, academic direction depended on the preferences, and sometimes the narrow-minded whims, of powerful outside figures. General statistical patterns could be observed: wealthy donors tended to be older, and the most generous donors were on average older still; it was not entirely surprising that major gifts appeared to go disproportionately to the health sciences. In most cases, wealthy donors had succeeded in their own fields by carefully evaluating investments and their returns. Many thus expected reports on how their gifts were paying off, and sometimes keyed future gifts to benchmarks established with earlier gifts. Donors often saw themselves as representatives of the public interest, but they naturally represented their own interests in a giving process that did not override but certainly influenced normal academic planning and review.

In each of these areas, external institutions and individuals increased their capacity to affect and monitor the university’s management of its own affairs. Again, this was not new. While serving as the president of the University of California in the 1950s and 1960s, Clark Kerr had sharply criticized the growing influence of federal research agencies over hiring and firing decisions, the structure, size, and budget of various departments, the allocation of physical space, the construction of new buildings, the creation of “new classes of administrators,” and the expanding relative size of administration
overall. For Kerr, the university was already serving as "bait" to be dangled in front of industry. But in the 1990s, the fish had become fishermen and were increasingly private, increasingly focused, increasingly individual, and increasingly sophisticated in their use of financial measures to evaluate the university's output as it was relevant to them.

Financial Incentives in Academic Planning

In addition to its focus on endowments, the 1990s university developed new financial strategies toward its educational mission. The most important and enduring of these was the cluster of techniques that has gone under the name of responsibility-center management (or RCM, along with related names such as revenue-center or activity-based management). RCM was developed during the 1970s and twenty years later was continuing to spread across the country. It sought to inject financial incentives into the budgeting decisions that schools, departments, and other units were making. Because the facilities, administrative, and other general costs were not charged to schools and departments but were paid by the central administration, RCM advocates alleged, these costs were not factored into academic decisions at those levels—how many new faculty to hire, which courses to shrink or expand, and so on. RCM sought to bring a complete budget to each unit so that each unit would know its total costs and its total revenues.

Universities and corporations alike had long used versions of centrally allocated, incremental budgeting, meaning that most or all units used the previous year's budget as a base; their budgets were then cut or, more commonly, augmented from that base. This made it hard for organizations to respond to new opportunities, whether they were product lines, research topics, or student enrollment shifts, since in the main the only funds available for new allocations were funds beyond those of the previous year's budget. When the organization was growing quickly, as companies and universities were doing in the 1950s and 1960s, new programs could be built with new money. When there was little or no new money, as in the 1970s, early 1990s, and early 2000s, new programs died before they were born. In a rapidly changing environment, companies and, to a lesser extent, colleges and universities could miss out on new growth areas (new product lines, new federal grant opportunities) because they did not have the resources to build the facilities, hire the faculty, and do all the other things required to set up activities that would be valuable in the years to come. This problem
was worse for public universities, whose relatively small endowments and, in most states, constant enrollment pressures meant that even small downturns in state revenues could bring development to a halt. Public universities in states with chronic budget problems, like the University of Massachusetts, the University of Michigan, or the State University of New York, were in danger of falling farther and farther behind in a death spiral in which losses (of students, faculty, grant funding) were met with ever-weaker countermeasures, which allowed the losses to continue to grow.

RCM was part of a larger business movement that reflected managers’ growing interest in retaining control while reducing the costly bureaucratic layers that had traditionally been responsible for it. It was associated with total quality management (TQM), which grew from the generally good idea to move decision making away from central administrators and toward line workers and shop-floor supervisors, who were closer to actual problems and could therefore come up with quicker and better solutions. These hands-on decisions would not occur unless employees had enough autonomy to make them more or less on their own. TQM would monitor the quality of the decisions by their financial effect, yet measures had to be calibrated to fit the smaller units that were making the decisions. Managers would know the results, but so would the line workers, who would be given financial information so that they could adjust their own activities according to their results. The method was sometimes called “open-book management.” The bad news for employees was that they would be held responsible for the financial effects of their work, and this would be especially bad news if even high-quality work did not improve the numbers: quality and financial results were treated as the same thing. The good news was that employees could in theory see the basic company numbers and had somewhat more autonomy from central administrators to determine their own work practices. The other good news was that this limited self-management seemed to be more effective financially than was executive authority.\textsuperscript{22}

We can simplify the detail-oriented practice of RCM into four main features.\textsuperscript{23}

1. Decentralizing costs and benefits. Operating units like schools, divisions, and departments would know their true costs, not just for telephones and office staff but for building maintenance and mortgages, water and electricity, and other expenses traditionally picked up by the central administration as overhead. The university would no longer take care of this overhead invisibly while also holding all revenues generated from
enrollments and then returning some portion as the unit’s annual budget. Courses, majors, and programs that lost money would need explicit compensation from other programs in the unit that made money. Transfers from profitable to unprofitable units were still permissible, but only after the real amount of such transfers was clearly understood by all parties.

2. Financial incentives. As a result of knowing the costs of their teaching and research, faculty would have financial incentives to evaluate their programs with their costs and revenues in mind. While finances were not meant to outweigh educational considerations, they were meant, in the RCM scheme, to become intrinsic to academic planning. The firewall between educational and financial metrics was to be torn down, even though everyone involved could tell the difference between the two categories.

3. Transparency and iterative collaboration. Although RCM might be used by administrators to assert control over academic programs, advocates repeatedly insisted that the implementation had to be a collaborative process between faculty and administrators. The budget was to be transparent, and everyone’s costs and revenues were to be known by everyone involved. This knowledge would at first be shocking and painful. An account of RCM discussions at UCLA described faculty members’ indignation at one another’s long-distance bills and express-mail charges, and transparency was shortly abandoned as too divisive. But these sorts of failures were to be taken in stride at the early stages of a multiyear procedure of community and institution building. When in late 1997 I asked the provost of the University of Illinois at Urbana-Champaign about the school’s campus-wide RCM-like budgetary overhaul, he replied that “we try hard to refer to our effort simply as ‘budget reform.’ There are some RCM-like elements in the design, but the overall system is some distance from having a classic RCM form. By avoiding labels that imply a set model, we have managed to keep the focus on improving practice through an iterative process, rather than driving the campus toward an up-or-out decision on a package.” The idea was that with the proper leadership and an organized process that could develop trust over time, most faculty would come to contribute to decisions that would be better because they were based on wider consultation and fuller financial information than had ever before been the case.

4. Educational strategizing. As a result of budgetary decentralization and new levels of financial clarity, educational choices would be more
rigorous. RCM advocates made an apparently paradoxical claim. “A major thrust of RCM, in fact its original raison d’être, was sensitivity to the marketplace. RCM quantifies the revenues and costs of all programs and demonstrates that the underlying academic or institutional value of a program is independent of whether it is subvened or not.”27 By seeing just how expensive a high-quality, low-revenue program was, one supposedly could defend it with the strength and purpose that its quality deserved and its costs demanded. One set of RCM theorists put it this way: educational programs generate revenue (or lack thereof) and “mission attainment.” “One might say these represent ‘love’ and ‘money.’ [A provost will] expand a program if the extra love plus the extra money exceeds the variable cost of expansion. . . . By doing this [the provost will] produce more value overall than if [she] considered either love or money alone.”28 In other words, the value of intellectual output (“love”), in the form of grammars of languages spoken by six hundred people or of commentary on the later Milton, certainly had nonfinancial value, and this was on par with quantified revenues. Both educational and financial outputs were valuable. The latter would not be allowed to replace the former: finance would be used simply to assess the economic costs of educational “mission attainment,” which would then be paid for in ways people could agree on.

The road to RCM was paved with good intentions, and it had potential to create more clarity, more collaboration, even something like more democracy in setting institutional directions. It has enjoyed a fair amount of success in various institutions.

But its success has been largely proportional to two factors, one well-known, the other less so. The first is the process of implementation: where this was gradual and inclusive, RCM improved at least the budgeting process, if not academic planning overall. The second factor, however, has been the context of implementation, where the culture wars were constantly putting nonfinancial “mission attainment” on the defensive.

The Limits of Finance

RCM had in principle solved one perennial problem of budgeting, which was that budgets traditionally had been established by a small set of administrators
in consultation with financial professionals. RCM imagined wide-ranging discussions among all interested members of the university community, ones structured and long lasting enough to allow the views of culturally quite different units to appear in the mix. Advocates were aware that cooperation among units required “leadership,” which generally mixes persuasion with coercion: USC’s experiment with RCM may have gone very wrong had that university’s president not unilaterally rejected some units’ plan to improve their revenue statements by getting a quick bump in enrollments through lowered admissions standards.29 To arrange for English and engineering professors to agree on planning principles would require skillful orchestration and negotiation. In this sense, since it acknowledged different stakes for different units and did not try to eliminate variation, we could hope that RCM might have evolved into the multiculturalism of budgeting.

But the cultural context elicited different impulses. Though RCM did not insist as culture warriors did on a core budgetary culture, it adhered to two of their prime directives. The first was a sharp dichotomy between financial and educational matters, which reflected the culture warriors’ distinction between economic and sociocultural development. The explicit aim of RCM was to support varied academic units by using finance as a universal language, one to which all separate strategies were finally accountable. Planning would proceed by establishing profit and loss figures for each unit and then covering losses in one unit with profits in another—as long as those losses could be justified as part of “mission attainment”—which was in turn embedded in accounting measurements. Finance was the privileged language of reality. How the institution was doing was first and foremost a question of its economic situation. Though skillful practitioners would not be too rude about it, the bottom line was comprised of dollars and cents.

The hierarchy of measures in which finance came first was signaled by language like that cited above, in which money is money and education is “love.” This language is deeply misleading: Education cannot be divided into functional and emotive halves like this, nor can its functional side be equated with money. Education is not a form of goodwill, nor is humanistic knowledge a heartwarming sideshow, the academic equivalent of an evening with family by the fireside. The university is in general not-for-profit, meaning that it exists to spend money on making citizens, engineers, writers, and the other forms of what is sometimes called “human capital” and that can also be called the creative capability of always-evolving society. Culturally speaking, RCM reinforced the culture-war belief that education
is a commodity as measurable as any other, and that administrators must sort the disciplines according to those that supposedly pay and those that supposedly do not. RCM is thus as hard on educational development—as dismissive of education's internal logics and conceptual independence—as any form of financial accounting.

At all campuses where I have had direct experience, administrators showed official esteem toward the educational mission and the liberal arts. They were not a mercenary lot, having after all chosen education over bond trading, and they appreciated the broader value of education. But it was hard for anyone to fight numbers with philosophy and love, especially under nonstop post-1970s financial pressures. The defenses of nonquantitative educational goods were abstract, long-range, and, in cultural fields, labeled "political," and the culture wars drove this last stake deep into the ground. Thus an urban planning school's investigation of contemporary school or housing discrimination would ask for funding in a context in which UC regent Ward Connerly was trying to outlaw the collection of racial information of any kind. Nonquantifiable benefits were harder to justify than were quantifiable ones. When the overall university was divided into cost units, accounting gave programs that attracted outside funds—materials science, mathematical finance—a natural advantage over those that provided services, required public sector involvement, criticized policy, developed human capabilities, or rested on self-sponsored research that lacked external markets (anthropology, classics). Returns on investment were potentially damaged by controversy, and yet controversy was built into most cultural study. The lack of paying customers now quantified by RCM, then combined with the presence of debate, threatened to keep cultural disciplines in a permanent state of underdevelopment. This was certainly their fate during the years of austerity. As the 1990s advanced, downturns coupled with accounting standards took a toll on dreams of the new: new programs, new disciplines, new combinations, new ideas that could not yet—or would never—acquire markets and revenues.

RCM rode the culture-war current in a second way. This was reflected in its hostility to budgetary equality among different disciplines and units. It started with the valuable idea that universities could not just keep adding everywhere, but translated this into the culture-warrior notion that relative equality was a violation of financial principles.

It is important to remember that universities had brought some fields of knowledge to great heights by defying market judgments about them.
American history is a good example, where the enormous range and depth of past decades of academic literature greatly surpasses popular media representations of the subject, dominated as they are by presidential and military history. Universities boomed intellectually through the postwar period's genteel socialism: by paying the overhead and related costs for all departments regardless of income, they ensured all disciplines the basics of a decent living. This internal sponsorship led to gradual reduction of teaching loads even in fields that lacked extramural support. As humanities course loads at research universities went from six or eight a year to four or five (still twice as high as loads in science and engineering), historians were able to increase and improve their output, and there is some reason to believe that the post–World War II renaissance in historical study—and the new, formalized cultural and social knowledge about the contributions of women domestics, African American professionals, Chinese railroad workers, Native American belief systems, immigrant farm and factory laborers—owes much to better research conditions for the relevant nonmarket fields. As a result of this revenue sharing, university fields developed a kind of general parity during the boom years, and certainly an equality of expectations for research and teaching performance that benefited every field of endeavor as well as the country as a whole.

In the RCM system, this kind of general provision was redefined as a subsidy that the institution provided to low-income areas. Since RCM advocates were not right-wing political activists, they did not criticize "administrative handouts" and complain about "university welfare" for the humanities. Nonetheless, they challenged the concept of general provision—on sound technical grounds—without insisting on a good basic income for all fields regardless of their financial capacity. This would not have been an endorsement of ongoing growth for mediocre and declining areas, but would instead have meant relative equality for fields that the academic planning process had endorsed, in the shape in which it had endorsed them. In this non-RCM system, educational value would have been the baseline, where good work on Milton and good work on carbon nanotubes produced similar amounts of intellectual value. Enormous variations in financial resources would then have to be judged by their necessity or by their effect on intellectual outcomes. The shoe would sometimes be on the other foot: were financial measures found to oversupport some fields some of the time, judged by their intellectual merit or social value, lucrative fields might now and then be trimmed. Informal evidence suggests that
this rebalancing regularly occurred, leading to the revenue "subsidies" that RCM systematically opposed.30

To each according to her intellectual need? It may have been academic quasi-socialism, but some version of that process of educational benchmarking (and evaluating financial distribution on those grounds) enabled the postwar university to reach unprecedented research heights.

In the world of the culture wars, inequality is natural and equality the result of unnatural intervention. Something like a bell curve was the normal distribution, while anything flatter meant monkey business, usually for populist political ends. Whatever its expressed intentions, RCM challenged the academic reality that culture warriors disliked, namely, the intellectual greatness that arose from collaboration enabled by shared resources and driven by curiosity or social goals. RCM was right to say that universities must have accurate, detailed budgetary information about all the moving parts of the complex institution, including one's overhead expenses. But RCM intensified the existing divide between financial and academic factors, where the academic was increasingly at the mercy of the financial. The university already knew how to worry about money. What was needed was a system for explaining nonquantitative educational benefits to a deeply money-minded culture, and this is what RCM made even more difficult. It instead perpetuated the duality of love and money, and campuses logically gravitated toward investing in fields close to the market. RCM was of little use in helping universities support the inventive teaching and novel research that were their main reason for existing, precisely because they would not be supported by its already existing customer base.

The rise of accounting intensified the first two dimensions of the culture wars: it offered color-blind budgeting that demoted other forms of value, and it defined merit in what we can call market-plus terms—merit was market value plus a little intrinsic intellectual value. Accounting further consolidated the culture wars' third dimension: it confirmed the market not as academic servant but as academic master, the de facto final authority on the health of the enterprise.
The Problem with Privatization

Accounting improved some aspects of university management. But as its, authority increased in university systems, particularly in the public systems, it was much easier to continue with the larger culture-wars project, which was the liberation of private interests from public goals that were apparently too egalitarian and expensive.

Universities were not an inherently easy sell for the market vision of human nature. Their expansion after World War II had underwritten the large postwar middle class, and public universities were largely responsible for the widespread improvement in the American population's general educational attainment, which in turn is widely regarded as a major source of the economy's health during that period. To put it another way, the success of higher education showed the dependence of American business on high-value public expenditure. Affluence could be traced directly to public funding and not just to private profits. The enrollment boom was paid for by populations that had become at least temporarily persuaded that they would get something good by spending public tax money.

They spent it more freely than they have ever since. The conventional wisdom in higher education today is that while public education is more crucial than ever, there is no will to support it with public funding. Studies of actual funding levels bear out this view. One by the Urban Institute showed that higher education's share of state appropriations nationwide fell from 6.7 percent to 4.5 percent in the last quarter of the twentieth century. More recently, steady or slightly declining appropriations, in real dollar terms, have not kept up with increasing enrollments. An analysis by the State Higher Education Executive Officers Association (SHEEO) found that
per-student allocations in fiscal year 2005 reached their lowest level in twenty-five years. Even after starting to recover in FY 2006, they were still about 15 percent below their FY 2001 level ($7,371 per student FTE). Since no one wants to beat her head against a brick wall, most educational leaders have come to say that colleges and universities should adapt to the new political reality of a permanently downsized public sector. This has generally meant only one thing—replacing declining public money with increasing private funds. This shift from public to private funding sometimes goes by the name “privatization.”

Most commentators saw a silver lining in all this. One important example was the book by Robert Zemsky, Gregory Wegner, and William Massy on “responsibility-centered management” that I discuss in chapter 10, “The Costs of Accounting.” Its authors were three influential educational administrators and analysts, and they called on universities to realize that they must become “market-smart and mission-centered.” Like many other observers, they lamented that universities now “pursue their own, as opposed to the public’s agenda.” On pressing issues like the continuing deterioration of public schools,” universities “have been seen as neither the problem nor the solution.” But Zemsky et al. argued that universities could keep their unique mission while being “market-smart,” and, in fact, that they could keep their mission only by facing, using, engaging, and mastering markets.

Zemsky and his colleagues’ initial example of this successful strategy was the University of Michigan (UM). Faced with a deindustrializing state economy and falling tax revenues in the early 1980s, UM decided to diversify its income sources. It increased private fund-raising, continuously raised tuition, and supported entrepreneurial faculty members in their quest for larger shares of both federal money and industry sponsorship. Zemsky et al. portrayed this as a great success on two separate fronts. First, Michigan succeeded in the market, especially when compared to peers who stuck with the public sphere. “In the 1970s Michigan and UC-Berkeley received roughly the same levels of core revenue. Three decades later, however, Michigan’s core revenues exceeded those of Berkeley by more than $400 million per year,” the result of “revenues earned mainly in the marketplace.” Second, Michigan’s privatization (my term, not theirs) correlated with a stronger public purpose. “Not so coincidentally, we believe, the University of Michigan also played the leading role in the decade’s most important litigation concerning higher education. In defending its use of race-conscious admissions policies, the University of Michigan and its
tough-minded, market-smart administration demonstrated what a mission-centered institution can accomplish in the defense of public principle.”

When universities help themselves they help society, the authors claimed, invoking an American tradition of seeing civic-spirited liberal capitalism as the source of a revitalization of public universities. They advocated a combination of “market-smart” and “mission-centered.” By “market-smart,” they appeared to mean two main things: (1) an acceptance of the shift from general public funding to a “user fee” model in which students and their families pay privately for their education; and (2) the use of financial measures to improve productivity. I have already criticized the second of these (chapter 10, “The Costs of Accounting”). An equally tricky issue is the first aspect of market thinking, in which higher education replaces lost public funding with higher student fees. We need to ask—if various commentators are right that entrepreneurship and partial privatization mean both more money and stronger public purpose, why would anyone oppose privatization?

**Grounds for Skepticism: The Michigan Downside**

Zemsky et al. made a familiar kind of claim, which implied a causal relationship between “going to market” and newfound wealth. The claim is unfortunately familiar in a less positive sense: they do not provide evidence of this causal relationship between “going to market” and new revenues. For starters, I have been unable to verify Zemsky et al.’s claim of a $400-million-dollar gap between Michigan and UC-Berkeley. Even were the figure correct, Michigan’s overall revenues come largely from nonmarket sources. Much of the university’s new money was public research funding: 60 percent of federal research money goes to the health sciences; Michigan has a large health sciences operation; and overall federal contracts and grants volume more than doubled in the twenty-five-year period in question and grew even faster in health-related fields. With its enormous medical centers and other high-volume science operations, UM was a principal beneficiary of this federal boom. Since UC Berkeley lacks a medical school, a more accurate comparison would be between UM and the UC Berkeley and UC San Francisco campuses combined. If the comparison is done this way, the gap disappears.

On the private side, Michigan did very well with philanthropy. But it is not clear what relation this success had to market-mindedness. UM already possessed a venerable and powerful fund-raising operation, particularly
with its alumni base, which is the largest in the United States, and UM receipts did not outpace philanthropic growth for American universities as a whole. UM did reap major new revenues through steep and continuous tuition increases, augmented by expanding each class's proportion of out-of-state students (who comprised 40 percent of entering first-year students by 2005). But much of these revenues replaced lost state funding rather than offered new money. Increasing “user fees” is a traditional strategy that is fully compatible with public funding and does not in itself signal a new adaptation to market forces.

As is also typical of the standard equation of market forces with greater wealth, Zemsky et al. did not factor in the costs of the strategies they describe. Although the University of Michigan remains one of the world's great universities, its rank has declined, at least judging by U.S. News & World Report's infamous reputational survey, where UM fell from eighth to twenty-fifth place between 1987 and 2003. UM's dependence on tuition revenue has not helped its selectivity: more than 50 percent of all undergraduate applicants were admitted in 2005, which makes UM about half as selective as UC Berkeley, somewhere between UC San Diego and UC Santa Barbara.8 UM's high proportion of out-of-state students has not helped its original mission of educating the population of Michigan itself. Michigan remains well below the national average in the percentage of the state's population that receives bachelor's or advanced degrees: one study calculated that merely catching up to the national average would require Michigan to increase the rate of growth at which bachelor's degrees are obtained from 1 percent to 37 percent by 2015.9 The focus of the University of Michigan's flagship campus on out-of-state tuition dollars could not support this public mission. While UM has done an effective job of protecting its Ann Arbor flagship, it has not protected the quality of the UM system, of Michigan higher education overall, or of higher education access for the residents of the state.

Something similar can be said about the composition of UM's student body. UM lost African American enrollments during the first wave of fiscal crises in the 1980s and has only slowly gotten most of them back (African American enrollments in the freshman class of 2005 comprise 7.2 percent of the total, about half the African American proportion of the state population).10 After strenuous efforts in the 1990s, the University of Michigan still has a Pell Grant rate half that of UC Santa Barbara's; at the other end of the income spectrum, more than half of Michigan's 2003 freshman class
came from families with six-figure incomes in a state where only 13 percent of families earn that much. The university's involvement with the Bollinger affirmative action cases was less an example of public leadership than a mandated self-defense, one that might have been avoided had UM been able to "afford" college preparedness and other recruitment programs for in-state students of color.

All these considerations suggest that "privatization" is not a recipe for improved fiscal, intellectual, or sociocultural health. It serves as such a recipe only within the ideological framework of the culture wars, in which market forces are always invigorating and never interfere with legitimate missions. In the real world, "market failure" is commonplace, particularly in the creation of services. Zemsky and his coauthors knew this perfectly well, and yet the cultural environment licensed them to write as though they did not. Privatization would need to work harder and better than this to make a valid case for itself—outside the world the culture wars made.

College Admissions: The Skew Toward Financial Returns

We might be particularly suspicious of privatization's effort to apply market standards to education when we recall that the university already had another, complexly evolved system of measurement in place, commonly known as meritocracy. Students have always been subject to open competition for test scores and grades—lots of them, every academic term. Faculty members had always had publication records, patents, prizes, awards, and a teaching rating from each student, every academic term. But these intellectual assessments could not be equated with market measures. They referred to standards of intellectual quality that had emerged over decades from within intellectual disciplines and that were continuously updated and refined by evaluating their outcomes. An optical processor chip, for example, was not rated on its financial returns—though it had great future expectations—but by its functionality as a solution to problems with existing bodies of established knowledge. Classroom standards were the same, where innovation and transmission were brought together. Intellectual returns were noneconomic, had much longer horizons, and did not exist in the world as a "rivalrous" form of property (where one person's use diminished that of someone else). They also actively sought spillover effects, where their value would travel beyond the ownership boundaries of the inventor or patent holder to affect society as a whole.
Throughout the 1980s and 1990s, intellectual factors tried to hold their own in admissions policy. Students still applied for places on the basis of their academic achievement. They were not thought to be admitted because of their future economic value to the university. Universities certainly hoped for future philanthropic returns that would follow from preparing the best students for lifelong success. Alumni cultivation had become a systematic practice by the 1920s, and top schools succeeded beyond all expectations—by the decade 1994–2003, Princeton received a remarkable 54.6 percent of its nongovernmental revenue from alumni; the comparable figures for Yale and Harvard were 52.7 percent and 41.8 percent, respectively. But even as admissions officers sought a “well-rounded” class that included future moguls as well as future artists, students were in principle admitted on the basis of their ability to contribute to the academic and extracurricular life of the university, and not on the basis of their ability to contribute to its bank balance. “Needs-blind” admission—admission that looked at qualifications and not a student’s ability to pay—remained the gold standard of admissions ethics.

But as cost pressures increased in the 1970s and 1980s, throughout this period admissions practice evolved toward the money. A series of books about the admissions rat race drew the attention of students and parents to the compromising of the meritocratic rules they had sought to master. Many of these analyses focused on affirmative action, but other forms of preference attracted increasing attention. The best known was preference for athletes, and a second type that received increasing attention was the “legacy preference”—the admissions advantages offered the children of alumni, particularly of wealthy alumni with a history of philanthropy. The legacy preference had produced a spin-off sometime during the 1970s at some private universities, like Duke, that wanted to compete toe to toe with Stanford and Princeton and thought they needed more money to do it. This spin-off was the “development admit”—a wealthy student whose family might become first-time contributors to the university if a relationship could be established by admitting their child.

This mercenary side of admissions became a national story during the Supreme Court consideration of affirmative action at the University of Michigan (see chapter 7, “Diversity in the Age of Pseudointegration”). A Wall Street Journal reporter had been assigned to cover that story and to find a new angle on it. Though feeling little hope of success, the reporter, Daniel Golden, began to examine the case materials. He noticed that one of
the undergraduate plaintiffs had been a legacy applicant, and had received 5 extra points (out of 150) for being the child of a UM alum. Golden wrote a series of articles on legacy and development admissions that criticized what was in effect an affirmative action program for the already advantaged and, in some cases, the wealthy and well connected. The articles became a book, and Golden elaborated the damage done to the careers of brilliant but “unhooked” applicants who were knocked out of contention by a “legacy establishment” that used elite universities to perpetuate its lion’s share of the country’s wealth and power.\textsuperscript{15}

In examining this kind of admissions, let us first look at the bright side, where legacy and development admits offer a classic example of market engagement in the university arena. Everyone can claim good intentions and moderation as they synthesize market demands with the world of knowledge and describe a win-win outcome. In a case like Duke’s, where in one period 3–5 percent of each class consisted of development admits, university leaders could argue that these wealthy students brought resources that made things better for everybody. Their full tuitions and family contributions to scholarship funds subsidize low-income students: development admits could be cast as a low-key “Robin Hood” project in which the university took from the rich to give to the poor. Later on, major gifts from wealthy alumni would allow the university to keep fighting cancer and addressing global hunger. On university campuses the rich are parted from their money not by the owners of racetracks and the builders of luxury yachts but by the stewards of teaching and research for the general good. The children of the rich are tutored in the world’s problems in the liberal classroom, increasing the likelihood that they will lead useful rather than idle lives. In the context of such arguments, even a 5 percent set-aside for the wealthy seems a small proportionate sacrifice for a large return. It seems an excellent example of balancing the mission with the market.

But there are many problems with this approach.\textsuperscript{16} The first is that it grants wealthy donors greater and often undue influence on institutional priorities. I broached this issue in chapter 10, “The Costs of Accounting,” and it is a serious matter that has not received enough significant analysis from administrators. To recap, the cultivation of wealthy prospects takes a great deal of time and significant money, and administrators are under pressure to make the university seem as congenial to the donor as possible. Controversial issues or faculty members may be kept out of sight, and may receive fewer resources than they otherwise might. A brisk, efficient atmosphere is
presented as the campus norm, though the struggle for new knowledge is anything but efficient in the standard sense. The interests and priorities of donors go to the head of the line, bypassing the normal campus planning process. Disciplines that faculty members may have rejected as too expensive or too far from existing campus strengths may become major sites of campus investment once seeded by outside funds. Some portion of intellectual leadership shifts off campus to the movers and shakers who also make the wider society attend to their concerns. The influence of the donor may be increased by the presence of his or her child on campus, who may in effect function as a native informant or spy on classroom proceedings and enable the parent to offer real-time criticism of academic activities. In short, the campus may become less an alternative to the society’s and the economy’s conventional concerns than an echo and extension of them—indeed, an important endorsing of those concerns through the imprimatur of its academic independence.

A second problem is that the argument for development admits lacks the intellectual dimension that is essential to the arguments for diversity. Diversity theorists argued that people of color, by virtue of their personal experience, cultural differences, distinctive perspectives, and, in many cases, their unusual socioeconomic challenges, make a unique intellectual contribution to the community. No one makes a similar intellectual argument for the unconventional insight that the wealthy bring to the classroom or lab.

Third, in contrast to the admission of members of underrepresented racial groups, development admits serve the institution’s private interest without serving direct public goals. Fourth, development admits create a double standard when they are coupled with the rejection of race- or gender-conscious affirmative action. Why should anyone balk at giving one applicant 20 points for being black when another receives a special, customized review process for being rich? Though most university officials favor some version of “comprehensive review,” in which race, gender, and other background factors—including family wealth—can be taken into account, this stance does not solve the deeper problem at issue here.

The Tuition Trap

The deeper problem is that private philanthropy can erode support for the public, “general fund” base for public higher education. Lessons from
private higher education have been transferred indiscriminately to public universities, in spite of stock differences in endowment base and student constituency between otherwise similar private and public universities. The boom in giving to education over the past twenty years has convinced many observers that philanthropy can replace public funding; the comments of highly knowledgeable figures like Zemsky and his colleagues are typical in this regard. I address the financial claim below. Here my point concerns the damage privatization does to general support for public funding of public institutions.

It is worth recalling that the general-fund model of educational funding regards all levels of schooling as sources of general social and economic development for all members of society. In chapter 6, “The Battle for Meritocracy,” I called this meritocracy II, a model that imagined education reducing inequalities of expertise among strata, enhancing everyone’s individual potential, and making the country more prosperous and equitable. When postwar universities aimed at this thing that throughout this book I have called general development, they established relatively broad and equitable forms of access. Sometimes this meant open admission for all applicants. Other times it meant selective admission with near-zero tuition—anyone with a good academic record could attend. At other times it meant affirmative action, outreach to underrepresented groups, and aggressive financial aid. In all cases, the goal has been the proverbial level playing field, in which general development rested on general rules and general access.17

We have seen that the culture war on affirmative action did much to destroy this vision among whites by convincing them that universities—particularly public universities—no longer offered a level playing field to their children. After several years of renewed assault in the early 1990s, “racial preferences” had become the explanation for why their white children were rejected by the taxpayer-funded flagship schools that offered the diploma that could give them a boost. The discourse of undeserving minorities ignored the fact that the multicampus University of California had sought to become a system of equals so that all admits, whether to Berkeley or Irvine or Santa Cruz, would attend an excellent school; it also ignored the decline of public investment that would have built more new campuses while making “flagships” of all the existing ones. Legacy and development admits also obscured the egalitarian vision. They said that wealthy kids, who should have aced their SATs and gotten excellent grades because of all the tutors and small classes they had already had, were entitled to buy their
way to the head of the line. On top of this, as I have said, these admits were just about the money—there were no social goals to soften the blow.

The same problems affected public universities that increased their tuition on a regular basis. Such increases reduced the public’s sense of the affordability and accessibility of the schools that it thought it funded through its taxes. One study conducted for the University of California noted that “voters who say that UC is unaffordable and out of reach are far less likely to say UC provides a high-quality education, contributes to California’s health care system, is a valued presence in the community, or even treats its employees well.”18 Though this 2005 survey showed substantial public support for the state’s public research university, and for its combination of public status and high quality, it also revealed a “tuition trap” stalking public higher education.

The tuition trap goes like this: The public is worried about college affordability, but its public university raises its fees. The university thus implies it does not actually depend on public funding, since it has the private resource of higher tuition at its fingertips. The university may also deepen this impression—that it can do without more public funding—by saying how good it is in spite of public funding cuts. Even worse, it may declare strong public funding a thing of the past in order to justify tuition increases or expanded fund-raising. Taxpayers then reasonably ask, if the university does not need more money, why does it keep raising fees? And since it keeps raising fees, why should we give it more public money?

The overall effect of all these moves—attacks on affirmative action admissions, then coupled with legacy and development admits and tuition hikes—has been to deepen the public’s cynicism about the university’s mission. If the university is just another cog in an economic system that is about getting ahead, charging as much as you can, maximizing your returns, and buying your way to the top, why should the general public pay for it? Why should the general public, whose income has stagnated for thirty years, give more taxes to a system that lets the top 1 percent purchase a VIP seat, or that favors applicants from six-figure families?

Being “market smart” in admissions has not only introduced injustices and hidden financial transfers; it has also damaged and eclipsed the vision of general development on which mass higher education depends. Admissions and tuition policy have become yet another arena of culture-wars effects, in which market forces and hierarchical development have seemed acceptable substitutes for equal access and general advancement.
Inevitable Stratification

Supporters of privatization have often invoked the truisms that markets enforce fiscal discipline, tell institutions what the customer wants, and fully support successful ventures. They have moved from there to the implication that universities could replace all their lost public funding with private funding, and even increase their funding overall. Zemsky et al. implied this in the passage I noted at the start of this chapter. The claim has been the major safety valve for public fund cutters. Well, advocates say, it is not good that the states are cutting funding for the economically and socially essential service we know as higher education. But we can always replace cut public funds with private money in the form of higher tuition. And we can smooth out the peaks and valleys with financial aid and private philanthropy.

The latter claim has made superficial sense, since by the early 2000s there was much new wealth at the top to be soaked up by higher education. But there was a lot of smoothing to do. The State Higher Education Executive Officers (SHEEO) plotted state expenditures per “full-time equivalent” (FTE) student against FTE enrollment growth and generated the visual roller coaster displayed in Figure 2.19

![Graph showing public FTE enrollment, educational appropriations per FTE, and total educational revenue per FTE.](http://mlis.state.md.us/other/Funding_Higher_Ed/2007/july9_SHEEO.pdf)

This graph told a sad story of public expenditures in what looks like a country that has suffered a series of coups d’état. But what goes down has seemed always to go back up again. So could private funding not act like fiscal lithium and at least smooth out the wild budgetary mood swings, or even provide some steady growth?

University budget officers, anxious to keep their institutions from appearing needy, seemed inclined to match the bad news of public funding with the good news of private money. The University of California offers a good example of back-to-back budget slides, shown to its Board of Regents in November 2006 (see Figures 3 and 4). If you take these budget slides together, and do not notice the enormous difference of scale, you might think that they cancel each other out: declining public funds can be replaced by private fund-raising.

To see whether this was really true, and whether the University of California could make up for recent cuts with other sources of income, I conducted a study with several UC colleagues—Henning Bohn (economics, UC Santa Barbara), Calvin Moore (mathematics, UC Berkeley), and Stanton A. Glantz (medicine, UC San Francisco). We were asked by the University of California’s Academic Senate Committee on Planning and Budget

![Figure 3](http://budget.ucop.edu/rbudget/200708/200708-budgetforcurrentoperations.pdf)
(UCPB) to provide a comprehensive analysis of past and likely future state funding trends for the University of California. Our report analyzed the impact of two waves of major cuts in state funding to California higher education and examined four scenarios for recovery from those cuts.\(^{20}\)

The results were not encouraging. We looked at "UC Core Funds"—excluding the medical centers, contracts and grants, and other business operations—in order to focus on funds that administrators could allocate for essential campus operations.\(^{21}\) We confirmed the story told in Figure 3—a dismal tale of an overall trend of declining education funding in a state with one of the largest concentrations of wealthy individuals and industries in the world. We quantified the declining state share of "UC Core Funds" (down to 45 percent around 2005 from 60 percent in 2001), and the state's declining contribution measured as a share of personal income. We found that the university's recipe for recovery, the May 2004 "Higher Education Compact" among UC, California State University, and the governor of California, which had promised five years of increases in state funding starting in 2006 (initially 3 percent and then 4 percent a year in the last two years), was in fact a recipe for further funding declines locking in budget cuts. By 2010, we calculated, UC would be about $1.2 billion a year behind its extrapolated 2001 funding level, and twice as much behind its extrapolated 1990 funding level (on a base of about $3.3 billion in state general fund
money in 2001). The funding gap could also be expressed as a quantity per student (see Figure 5).

Since the Compact did not in fact protect public funding, we suggested that such protection required a return to the 2001–2002 trajectory. We also noted that a recovery of the funding levels associated with UC's traditional quality, measured as student-faculty ratios and other data, required a return to 1990 levels of contribution, measured as a share of state personal income (an increase from the 2001 level of 0.29 percent to 0.36 percent over a period of five years).

These conclusions were greeted within the UC Senate and administration with a combination of agreement (with the calculations) and pessimism (about the "political realities"). No one in a position of responsibility felt that UC could ask the state to move to a higher level of funding. No one thought asking for a higher fraction of personal income would work with the public. Some observed that any request for a state funding increase from UC would be accompanied by a parallel request from Cal State, meaning that UC's $1.4 billion request would come to well over $3 billion a year once
our companion system got involved. Arnold Schwarzenegger had promised both wealthy and working-class constituencies that he would hold the line on new taxes, and he was set to remain governor for the rest of the decade. Every discussion seemed to show that the way to greater public funding was entirely blocked.

Our report, however, included another scenario, which we called the “Public Funding Freeze.” We imagined the following, not unlikely, situation:

Another downturn in state finances and continued political opposition to tax increases prompts state and University leaders to reluctantly conclude that it would be better to conduct an organized shift away from public funding than to suffer further uncertainty amidst a new cycle of budget crises. They decide to become a “state-assisted university” and to “privatize” centrally and systematically. State leaders agree to cap the General Fund at 2005–06 levels (in nominal dollars), to allow the General Fund share to decline to 15% of the university’s overall budget (or about 1/3 of the “core”) by the end of 2010–2011.

Under this scenario, undergraduate fees rise as quickly as seems politically prudent; graduate and professional school fees rise to “market” levels as rapidly as possible; annual increases are routine and significant. Non-resident tuition (NRT) is raised even higher. UC also allows the share of in-state students to fall so that they can be replaced by high NRT-paying non-state residents. Most state leaders expect that over a further 10-year period (ending in 2020–2021), General Fund contributions decline to levels already achieved by the flagship public campuses of several states, including Colorado, Michigan, Vermont, and Virginia (8–10% of the overall budget, or 18% of “core” funds in Vermont’s case and 22% in Michigan’s case) . . . The University loses an additional $1.7 billion each year beyond the Compact’s funding level, including the costs of increased financial aid to offset increased tuition.  

We then calculated the reduced public contribution: for example, the public spends half the share of its income on UC that it had a decade earlier (down to 0.15 percent of per capita personal income by 2011).

Our main interest was whether private funds could replace public money after all these cuts. The philanthropic picture was bleak:

By 2010–2011, the General Fund is $1.11 billion below the level anticipated by the Compact, and has an additional half-billion dollars in financial aid
obligations to cover. The administration looks to endowment sources to make up the shortfall. Taken all together, UC's various endowments approach $10 billion, and pay out close to $400 million a year. But 97% of giving to the university carries restrictions, so very little of this money is available for support of core functions. For the endowment to pay out $1.1 billion, it would need to be nearly $25 billion, putting it at the level of the oldest and largest endowments in the country. But to obtain one billion dollars in unrestricted payouts, the University would need to raise $25 billion in unrestricted gifts, which, given the normal rate of restrictions on fundraising, would require a far larger amount. In addition, to reach the 2001-02 funding level, more than $54 billion in unrestricted endowment would be needed. These efforts would come on top of normal fundraising. To put this number in perspective, every man, woman and child in the state would have to contribute about $1500 to an unrestricted endowment fund, one devoted exclusively to the University of California.23

UC officials would clearly need to turn to tuition increases to fill in the multibillion-dollar gap ($2.5 billion below the 2001 pathway). Tuition in this scenario would increase annually until it was more than $15,000 a year in constant dollars, matching the highest public university levels in the country. We projected a significant loss of student enrollment at all but the two flagship campuses, those that could compete successfully for a national student body with Michigan, Columbia, and similar schools.

The outcome of all this would be the end of the UC "system" as we know it. The "One University" would have become impossible financially, and administrators would reduce their ambitions and services to fit their finances. Many campuses would no longer function as full research campuses, and would offer more of the cutbacks they had already been offering their students: larger classes, less advising and counseling, older equipment, less personal attention of the kind that can turn middling into excellent students. These cutbacks would be particularly noticeable in graduate programs, where funding would fall further behind that of peer institutions and all campuses would lose most of their best applicants to more affluent institutions. Political and educational leaders would promise that high tuition would be accompanied by high aid, but this is easier said than done as financial aid comes head to head with the needs of core operations. Student bodies would lose their disadvantaged members in higher proportions, undoing recent strides toward equitable racial representation. In addition to
reducing educational capacity, campuses would be forced to degrade working conditions, meaning fewer and smaller raises, more departures of the most productive faculty for greener pastures, and lower retention of key staff and skilled technicians. The outcome would be something like what Michigan, New York, and Texas have now: systems where relatively poor and academically struggling institutions coexist with one or two research flagships in a phrase stratification.

Ending Quality for All

Although the culture wars have seriously damaged the prestige of public funding, it is important to see behind the ideological curtain. It was public funding that built the University of California as a system that could take all academically qualified students and give them a roughly equal education. Berkeley was more famous and had more Nobel-prize winners than Irvine, San Diego, or Santa Barbara, but massive public funding took the new campuses of the 1950s and 1960s from zero to sixty in the university equivalent of about five seconds. Within a few years of their founding, even the new UC campuses had superb programs and high-quality faculty that brought advanced research into the classroom. As time went on, the different rankings of the campuses would even out: by the late 1990s, six of UC’s eight general campuses were members of the prestigious American Association of Universities. By 2000, UC San Diego, created in 1959 from the Scripps Institute, led the UC system in federal research expenditures, appeared above UCLA in some rankings, and had one of the most successful technology-transfer programs in the world.

Having a whole system of high-quality research campuses made an enormous difference for the college-aged population. It meant that UC-qualified high school graduates—technically the top 12.5 percent of all graduates—would not have to compete with one another solely for places at one of two flagships (though Berkeley and Los Angeles remained the most coveted campuses). If fifty thousand California high school graduates were eligible to attend UC, then all fifty thousand could attend a top-ranked UC research campus, rather than, say, eight thousand going to a flagship (like Austin in Texas, Madison in Wisconsin, Ann Arbor in Michigan, Chapel Hill in North Carolina, Gainesville in Florida, Urbana-Champaign in Illinois, or Buffalo and Stony Brook in New York) while the other forty-two thousand highly qualified students made do with the more limited opportunities of a regional state college.
There is a school of thought that says that this kind of college stratification does not matter—the main thing is to get students through a two-year college at least, or any kind of four-year college, since the salary and public payoffs of attaining these levels are measurable and sufficient.\textsuperscript{24} There is no doubt that excellent faculty are to be found at community and regional state colleges, along with wonderful teaching and academic experiences that change people’s lives. State colleges also train the majority of practitioners in fields like nursing, teaching, and social work, fields that have a high social value without an equally high wage.

But there are major economic and sociocultural losses when a state sends only a fraction of its highly qualified high school graduates to a major research university and assigns the rest to state colleges. Studies of these differences are incomplete, but we can extrapolate from clear differences in conditions and mission. State colleges have fewer resources, offer less or little research, and generally place fewer of their students in positions of social or professional leadership. Students coming out of them have lower incomes than students from major research universities (public or private) and pay less in taxes back to the states that educated them. On average, state college graduates have more limited prospects. States that send a higher percentage of their public university students to regional rather than research universities have lower average incomes, and, we can infer, more socioeconomic stratification within their college-educated middle classes.\textsuperscript{25}

These differences in social impact between public research universities and state colleges rest in large part on the different educational missions of these institutions. Put simply, research university undergraduates are more likely to be exposed to both the results of advanced research and the process through which research creates new knowledge.

As one example, the structure of an undergraduate education that includes research was articulated by a University of California task force. The group divided the components of such instruction into a three-part system called TIE:

- Transmitting the Knowledge Base
- Initiating Intellectual Independence
- Emphasizing Independent Inquiry\textsuperscript{26}

In a research university, knowledge transmission is largely the domain of "lower-division" instruction, which takes place in the first two years of the four-year program. In principle, during next two years, and especially the
senior year, students develop the practices of intellectual independence. This independence is crucial to both creativity and leadership. It is also the essential ingredient of the “lifetime learning” that the contemporary economy is said to require. Finally, the third component offers actual experience with independent inquiry. This experience takes place largely outside of the “push” medium of the classroom, is fully interactive, and requires the student to originate, initiate, problem define, problem solve, and think outside the proverbial box. The “independent study” is one familiar venue for this activity, as is directed research, in which an undergraduate prepares for a career as a knowledge creator in his or her own right.

It is worth emphasizing that research faculty do not see independent inquiry as an add-on or special challenge for only the most gifted students, but as the destination of undergraduate education overall. The UC task force described these individualized forms of instruction as “the crowning accomplishment of instruction in a research/scholarship/performance-based university.” This vision has also long been the core strength of the liberal arts college, where small numbers of undergraduates work in small groups with faculty to produce their own independent research in the form of a final project or senior thesis.

We can say, then, that the genius of public education has been high quality on a mass scale—the equivalent of a senior thesis for everybody. The genius is mass quality. The means is achieving independent inquiry for all. In mass public systems, that role has fallen largely to the major research university.

There is thus an obvious comparative advantage in a system with ten research campuses rather than with one or two flagships in conjunction with many lesser ships. The advantage is clear from the perspective of human development, since a much higher proportion of qualified students is attaining the state of creative independence that is this development’s central feature.

The advantage of a system of roughly equivalent research campuses is also clear in the salary markets. Studies of wage shifts in the 2000s noted that the gap between workers with only bachelor’s degrees and those with advanced degrees was widening more quickly than that between college-degreed workers and those workers with only high school diplomas. Between 2000 and 2005, the real wages of college graduates actually declined by 3.1 percent. On the other hand, the wages of workers with PhDs increased by almost 3 percent, and those with professional degrees by more than 10 percent.

This gap is not a cause for celebration: The advantages of professional degrees owed much to high barriers to entry, that is, to licensing protectionism
that prevented most of the competition with lower-wage foreign workers that helped drive down wages in most other sectors: “It is in the middle — where many four-year college graduates work — that imports, overseas outsourcing and technology seems to be reducing U.S. employer demand most significantly, and thus restraining wages.”29 But some of the wage difference stemmed from what the advanced degrees represent: higher levels of training and more developed capacities to innovate and restructure systems on an ongoing basis. At research universities, undergraduate instruction comes closer to offering the features of postgraduate education. It gives graduates a better chance of acting to improve complex situations rather than simply adapting to them.

We are now in a better position to see the crisis that privatization has posed for undergraduate instruction at public universities. The components of intellectual independence and independent inquiry described by the UC task force on undergraduate education are labor-intensive: the best versions involve senior faculty working with groups of two or three students, or with students one-on-one in the tutorial structure that was devised at Oxford and Cambridge for England’s upper classes. At public universities, instruction is precisely that component that depends almost entirely on state appropriations: private giving, as we have seen, is almost always restricted, and goes to targeted research, sports, trademark-building projects, and the other special interests of donors. When state funds are cut, instruction is cut: faculty are not hired or replaced, more teaching is done with less expensive lecturers and teaching assistants, class size is increased, and classes are dropped. The first classes that are dropped are the small and advanced classes that are not “efficient” from a budgetary point of view. In the most recent round of cuts, the economics department on one UC campus redefined a “seminar” class size from 15 to 50 students, which made an obvious mockery of a concept designed to encourage full student participation and active learning. A biology department on another campus reduced its “capstone” seminar requirement from two courses to one, and a history department eliminated its seminar requirement altogether. In short, private funds do not pay for teaching, and the most vulnerable teaching is the labor-intensive kind with the greatest returns for both individual and society.

The president emeritus of one of the tiered state operations, the University of Wisconsin system, has studied the effects of “de facto privatization.” She concluded that it is mostly likely to divide public systems into two major groups. One group, “specialist” or regional universities, focuses on
satisfying current workforce and public needs by continuing and upgrading established disciplines. The second group is the “creative university,” which “looks not to respond, but to create the future by making large investments in new interdisciplinary research fields (nanotechnology, biotechnology, and so on) that use the intellectual resources of the university in new, team-oriented ways.” These creative universities will consist almost entirely of public flagships like Wisconsin-Madison, Michigan-Ann Arbor, Minnesota-Twin Cities, and the like, and of course, of wealthy private universities. “Ironically,” she wrote, “private research universities may be better equipped to fulfill this public purpose of creating the future than traditional public universities.”

The result would be a clear stratification between private research universities, whose limited scope means that their graduates form a small elite, and the public systems that teach the overwhelming majority. In this privatizing world, “public universities [meet] their public purpose primarily through applied research and educating graduates for life and the professions, as private universities increasingly take over cutting-edge research that enables the nation to grow intellectually and economically in the future.”

Such a situation spells the end of the majoritarian vision of quality for all. It erroneously resepares creativity and the masses in order to save money in the short term. It revitalizes a class system that belonged to the assembly-line approach to labor management that the knowledge economy had supposedly made obsolete, while damaging both social justice and economic effectiveness. When forced to participate in this return of social and economic leadership to a small elite through the downgrading of mass higher education, the public university sides with the backward current of contemporary history I have linked to the culture wars, undermining general development and its broad public constituency in one misguided move. It is no wonder that senior education leaders have started to think the worst: the president emeritus of the University of Michigan wonders whether “one might . . . conclude that America’s great experiment of building world-class public universities supported primarily by tax dollars has come to an end.”

The logical conclusion here is stark: high-quality, large-scale public education requires strong public funding. Private funding does not come in sufficient supply to support core operations: teaching lower-division courses, writing tutorials, calculus and bench laboratory experience, language instruction, seminar interaction, independent study, and well-staffed large lectures in which students continue to get adequate personal attention. Personal
attention is the core element of high-quality mass higher education: the brilliant top will do fine on its own, but the other 95 percent—with plenty of potential but with less experience, training, entitlement, and confidence—need the kind of highly developed teaching infrastructure that costs serious money. The point is worth repeating: high-quality education for elites is cheap, since there are not that many students involved.\textsuperscript{33} High-quality education for the great majority is expensive, and private sources are unable to support it.\textsuperscript{34} Private funding works at some exciting, creative, but narrow margins of higher education, while doing next to nothing for the instructional core on which its public mission depends.
The Failure of Market Measures

I will start this chapter by reversing the emphasis with which I ended the last one. I note, therefore, that private funding does help some highly focused activities that are too new or advanced to have acquired a constituency. Advanced research is a good example of an area where privatization can work wonders. Specialized legal clinics that provide free advice on health insurance law for poor or unwell clients who cannot afford to hire a private attorney are another example. If these are interests of a faculty or administration, and of real social benefit, why not try to find a small group of special financial supporters rather than lay yet another claim on an overstretched state general fund? Or to take another example, why not accept a wealthy family’s offer of seed money for an autism clinic, even though it means diverting public money from other areas in order to build and operate this good unit toward which state money never would otherwise have flowed?

Moving inventions into society is one of the great things that the university does. “Technology transfer” is a general term for the process that leads from inventions in university science and engineering fields to things that people can use in their everyday lives. The term refers to many different aspects of the process whereby discoveries move from “bench to bedside”—from a concept that gets proven out in the lab to a product that improves or saves the lives of many people. In general, technology transfer has great social value and is a central part of the university’s public mission. It is often boosted by infusions of private money that come at the right time, or are focused on the right research objective, or leverage insufficient public funding so that a project can leap a difficult hurdle. The question here is not whether or not technology transfer as such is a social good—it is. The question is not whether private-public partnerships should exist—they should.
The question is whether the discourse of privatization skews technology transfer such that its public value is distorted or reduced. Like every other university activity, technological research and development have been operating in a culture-wars atmosphere that assimilates social purposes to market forces. Could culture warriors show that market forces and their financial incentives improved the quality and quantity of research in ways that neither social nor intellectual goals could? Was the market now doing for science what blue-sky curiosity and public funding had never done?\footnote{1}

The Social Roots of Research

Culture warriors had their work cut out for them, for even neoclassical economists agreed that innovative research required public investment. Their key insight was that “market failure” characterizes innovative research. This does not mean that research fails markets, but that markets fail research: market calculations cannot correctly estimate basic research’s future value. The future value of such research is possibly large but actually unknown. Since the future value is incalculable, anyone rigidly calculating the future value of basic research will perceive investment risk to be infinite, and will logically put their money into an activity whose returns are more predictable. To make matters worse for market measures of R & D, firms also know that they are unlikely to capture more than a small fraction of the overall value of the patent for their own organization. Individual firms are thus less likely than they should be to invest in R & D that might have had a large monetary and social value some time in the future.\footnote{2} Kenneth Arrow made the point with particular directness in 1962: “We expect a free enterprise economy to underinvest in invention and research (as compared with an ideal) because it is risky, because the product can be appropriated only to a limited extent, and because of increasing returns in use. This underinvestment will be greater for more basic research.”\footnote{3} The more innovative the research is, the less likely the market is to fund it correctly.

Such considerations led many mainstream economists to advocate substantial public support for basic research in the mid-1950s. The costs of long-range research that was too great for any one firm would be shared by society. Economists offered good neoclassical reasons to support the National Science Foundation and similar institutions that offered public subsidies for activities whose public value far exceed the profits that any single firm could expect to recoup. These economists showed that financial incen-
tives would in general fail to support an optimal or even adequate level of basic research. The only solution was public subsidy. Research would serve the market eventually, but only if it was not measured by market returns.

Contemporary economists have made similar arguments. In a series of articles and a comprehensive book on the economics of intellectual property (IP), the economist Suzanne Scotchmer has confirmed in various ways that “for investments in R&D, unlike ordinary capital, the social value of a marginal investment is not equal to the private value”; the social value is often greater, and investing in it cannot depend on market incentives like IP ownership for an individual person or firm. This key conclusion was repeatedly confirmed by the work of other economists as well as by business historians and entrepreneurs. The 1990s start-up founder Charles Ferguson noted that the failure of the efforts of major technology companies to start an Internet on their terms was directly attributable to the companies’ attempts to design it around their proprietary technology. The success that we know as the Internet today was publicly funded, nonproprietary, multicentered—and was established long before anyone could imagine making any money from it.

Such analyses could lead to recommendations for a publicly debated industrial policy. In the United States, where industrial policy is unthinkable, ad hoc public investments have taken place anyway. At the end of the 1990s, the Clinton administration launched the National Nanotechnology Initiative, and not long afterward, in 2001, California governor Grey Davis persuaded the state legislature to give $300 million in state funds to start the California Institutes of Science and Innovation at the University of California. Scotchmer has recommended the creation of an international research funding consortium along the lines of similar international bodies for intellectual property regulation, trade agreements, and the like, based on the findings of orthodox economic modeling.

The public origins and benefits of basic research have been apparent in the industrial regions and networks for which the United States has become renowned. Silicon Valley and Route 128 depended on private capital but functioned well because of distinctive sociocultural features: a concentration of human capabilities, unintended network effects, informal knowledge circulation, fortunate, unplanned collaborations, massive public investment (decades of defense money in Silicon Valley), and major universities. The cultures of such regions have also been unusually good at articulating the social dimensions of innovation systems: these descriptions included Richard Stallman’s Free Software Foundation, which has sought to
keep software development nonproprietary; Tim Berners-Lee's understanding of open access, which influenced his development of the universal resource locator (URL), the Wired crowd's fascination with self-organized systems; Lawrence Lessig's free culture; and Manuel Castells's elaborations of the network society; not to mention a widespread interest in applying chaos theory, complexity theory, and fractal mathematics to sociocultural systems.

To be taken seriously in American political culture, the thinkers behind these concepts have at some point claimed to be following the market. But in reality the market was only a piece of the overall operation of these nonlinear organizations and networks of organizations. When we view the source of a systemic intensity like "regional advantage" in all its sociocultural complexity, we see that the transfers of information and interests and motivations and attachments look superficially like markets but are almost wholly social and nonfinancial. Most of this transmission is free. Quite a bit of it is paid for publicly, and collectively. To collect a toll would block much of it from taking place. The cost of monitoring and charging would be greater than the financial value of the transmissions, which at an early stage in a long-term creative process have in fact no financial value. The innovation capability of the overall system depends on its collective activity—on a vast collaborative labor that no one directs.\(^7\)

The university fits right into the country's actual innovation system. It is the paradigmatic instance of "free" in the sense of open, of collaboration with low overhead, of ideas developed with knowledge and not money in mind, of cross-subsidies that enable complex work to continue longer than markets would let it. Technology transfer in its broadest sense—as the process of moving inventions into society—is one piece of a system of agents interacting with mixed resources, mixed motives, and complicated aims (for-profit, not-for-profit, short-term, long-term, educational, instrumental). Sometimes patenting an invention can help continue the development process: there are cases where patents are required to attract private investment at a pivotal stage, or to enable inventor control so the invention develops in an optimal direction. This does not mean that patenting is a universal solution or has no downside: broad studies of patents show that their average value is very low; furthermore, the large majority of patents do not normally recoup their costs of prosecution.\(^8\) Given the realities of the innovation system, tech transfer would ideally stay flexible around the issue of IP, use proprietary structures only where they added clear scientific and social value, and focus on preserving the research communities on which
progress depended. Like all innovation processes, tech transfer would be regarded as a market failure but an intellectual and institutional success.

The Tech-Transfer Tale

But technology transfer came of age in an era in which acknowledging social and collaborative forces was increasingly difficult. The tech-transfer process was defined by the Bayh-Dole patent legislation of 1980, which, along with related legislation and court decisions, gave universities ownership of the intellectual property created by their employees through government funds. In subsequent years, continuous advocacy tightened the perceived causal link between increased disclosures and patenting activity on the one hand, and the university’s ownership stake on the other. Though the Bayh-Dole Act may have been most important in the boring details that helped standardize licensing processes among the federal government’s many funding agencies and helped support new research partnerships, the act came to be identified with the power of market incentives to inspire science and technology through intellectual property ownership.

The standard survey of tech-transfer results has been conducted each year since 1996 by the Association of University Technology Managers (AUTM). This organization has also dominated the story about how technological innovation actually works. For example, the 2004 survey framed its statistical results with the following highlights:

- The U.S. Patent and Trademark Office issued more than 3,800 U.S. patents in fiscal year 2004 to universities responding to the AUTM Licensing Survey; less than 250 were issued to universities in 1980, the year the Bayh-Dole Act became law.

- In the U.S. alone, 567 products based on university or nonprofit research results were introduced in fiscal year 2004, and more than 3,100 new products have entered the marketplace since fiscal year 1998.

- Today’s product development activity contrasts sharply with the situation before Bayh-Dole, when the government held title to patents discovered with federal funding. A 1968 study found that no drug to which the government held title had ever been commercially developed and become available to the public. By 1980, 28,000 government-funded patents had been issued by the U.S. PTO and were gathering dust.
These points offered a typical mixture of statistical reporting, as in the ambiguous second bullet point, and repeated references to a pre-Bayh-Dole dark age, as in the first and third bullet points. In reality, scholarly studies of Bayh-Dole’s effects do not confirm the simple linear connection between university title and commercial development. But AUTM regularly asserted a causal connection between the Bayh-Dole regime and these major increases in patenting and product development.

To continue the storyline, AUTM’s presentation featured a continued rise in the volume, the value, and the economic importance of university-based tech transfer (see Figure 6). The clear implication here was that Bayh-Dole enabled steady annual increases in invention disclosures, patent filings, and the public benefit of new products.

The same trend appeared in the graph of licensing income, the majority of which came in the form of licensing royalties (see Figure 7). By 2004, universities had a combined total of nearly $1.5 billion in gross licensing income (before various costs and inventor share payouts). The continuous rise appeared to correlate with a constantly increasing contribution to economic growth. AUTM also reported a less steady but overall increase in the annual number of start-up companies that came from university sources, totaling 4,543 between 1980 and 2003. There thus seemed to be a link con-

necting patenting, revenues, start-up activity, new products, and hence new sources of economic prosperity.14

But in reality the financial picture was much more mixed. The vast majority of universities involved in tech transfer received fairly small revenues from them. Of the 196 institutions reporting, around two-thirds made $1,000,000 or less in licensing income. About 30 institutions made more than $7.5 million each, and eight more made more than $5 million. The kind of numbers that affected research budgets were limited to a small number of very large players: MIT, Stanford, Harvard, Columbia, the University of California, and the University of Pennsylvania, and a few others. Although some newer entrants had risen in the ranks, mostly through a small number of blockbuster patents, the universities that made lots of money on patent licensing were generally those that already had lots of money.15 The same skew was apparent in the figures for large patents. Patents that yielded more than $1 million a year in income comprised 1.5 percent of the total (or 167 licenses).16 AUTM reported that 66 institutions had one of these. AUTM also reported that three institutions had more than ten “mega-licenses,” meaning that a minimum of about 20 percent of the licenses held by this top 1.5 percent were held by approximately
5 percent of this group of institutions. Such figures suggest that the tech-transfer system offered plausible financial incentives—in the form of a good shot at major income—to only the top fifteen or so universities. Michael Crow, while the head tech-transfer official at one of these dominant powers, Columbia University, advised the journalist Jennifer Washburn to assess a university’s tech-transfer chances as follows: “‘Look at the list of top university royalty earners that AUTM publishes.’ . . . Any school whose tech-transfer activities ‘rank below fifteenth’ on that list . . . doesn’t have the research capacity, talent, or resources it takes to do commercialization successfully.”

The implication here is that tech transfer has skewed and partial market outcomes, but strong and important psychological effects. The chance for a large payout may stimulate certain scientists to go to new lengths to produce viable results. Actual market results are far smaller than the hopes they stimulate. Perhaps because of the limited revenues, AUTM began to place greater emphasis on scientific and social arguments for tech transfer.

Returns at the Top

What if we focused on the lucky few? A good example is the University of California, which has ten campuses and the largest tech-transfer operation in the country. The numbers look good in the initial aggregate. In the 2000s, the number of inventions reported each year increased from under 1,000 to closer to about 1,300 in five years. The overall number of active inventions went from 4,481 to 6,618, while the number of inventions earning royalties increased from 767 to 1,088.

But a further look revealed another story. In the first five years of the 2000s, patents actually issued were up and down (easing from FY 2000 to FY 2004 from 324 to 270; for the UC system as a whole, there were 270 patents issued in FY 2006). Overall licensing revenues were up and down. The same was true for licenses or options issued—down from 249 to 204 in FY 2004 and back to 226 in FY 2006. Total licensing revenue was $88 million in FY 2002, $80 million in FY 2004, $93.5 million in FY 2006—again defying a strong trend or a large yield.

Such data suggested that even the most powerful tech-transfer operation in the United States was not a growth machine. It fluctuated with the business cycle and other factors. The data also suggested that UC tech transfer was not on its way to providing a meaningful revenue source for research or anything else. In FY 2003, federal research funding to UC amounted to nearly $2 billion; overall extramural research funding was around $3 billion;
UC's overall budget, excluding the national laboratories, was $13.8 billion in that year.22 Thus UC's patent royalties for FY 2004 were about 2.67 percent of its overall research funding. If strategically applied, such an amount could make a difference to a handful of programs, but it was destined to remain a fraction of overall research.

Unfortunately, we are not done whittling away at the funds made available to the university through technology transfer. Further losses can be noted in Figure 8. Various inventor shares took almost 40 percent of revenues, and net legal fees another large slice. This left about one-quarter of gross revenues, or just under $20 million, in that year to the campuses. It is reasonable to assume that the bulk of this went into covering either the indirect costs of research or direct costs that the granting agency was unwilling to pay, and in the case of some foundation and industry gifts for research, these can be considerable. The amount of royalty income that

went back into research was, in this year, $400,000 for the UC system as a whole. This small number is somewhat greater than 0.01 percent of UC’s research budget for that year (net income overall was about 0.67 percent of research revenues).23 No one would be pleased with this figure (or that of any other major research university) as a “return on investment.”24

UC’s size and increasing decentralization did not overcome another feature we noted in AUTM’s national numbers, which was the skew in licensing revenue toward a small number of blockbuster patents (see Table 5). The top individual patents paid out extremely well. But in FY 2004 UC had 6,618 “active inventions,” of which 1,088 had at some time earned royalties. The top five produced one-half of all revenues, and in FY 2006 that percentage had fallen, only slightly.25 (Here UC did better than average, for AUTM’s 2000 survey found that the top five inventions at an institution generate on average 76 percent of total revenues.)26 About 15 percent of all UC patent revenues came from the top single invention, the hepatitis B vaccine, whose patents were by the early 2000s about twenty-five years old. Such figures suggest that the vast majority of all active licenses return next to nothing. A comparison of figures for inventions and licenses shows that 84 percent of UC’s “active inventions” did not have an active license. Even a strong and fairly decentralized tech-transfer performer like UC did not break the national pattern of a remarkable disproportion between its top patents and the rest. Nor could an increased focus on patenting ensure increased innovation of the kind that led to revenue: only two of UC’s top 25 patents had been disclosed after 1996.

The point here is not that the University of California and American research were doing badly. To the contrary, they were producing the normal market results of doing research very well, which (with rare exceptions) is to spend lots of money rather than to earn it. The market results of innovative research are, as research results, close to nil. This is as it should be: the purpose of innovative research is innovation—discovery, invention, and scientific progress. This research has great long-term and social value that could not be captured as licensing revenue or estimates of the market value of patents.

The contribution of the research university can best be appreciated in broader, postmarket terms. The research university was designed to investigate every topic of conceivable public interest, from astronomical physics to agricultural genetics and everything in between. Major commercial returns accrued to research in a fairly narrow band of fields largely found in information technology and biomedicine, though there are exceptions (among UC’s top producers is the Camarosa strawberry, a standout in a list of mostly health-
related royalties). Nearly all research produced value for society by feeding into further research in the continuing process of expanding our knowledge of everything under the sun. Some of this knowledge would eventually produce profitable products and perhaps new industries, but it belonged to a tiny

Table 5  UC Top-earning Inventions
Year Ended June 30, 2006

<table>
<thead>
<tr>
<th>Invention (campus, year disclosed)</th>
<th>$ (Thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis-B vaccine (SF, 1979 and 1981)</td>
<td>15,299</td>
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<tr>
<td>Treatment of intracranial aneurysms (LA, 1989)</td>
<td>8,763</td>
</tr>
<tr>
<td>Dynamic skin cooling device (IR, 1993)</td>
<td>7,037</td>
</tr>
<tr>
<td>Interstitial cystitis therapy (SD, 1980)</td>
<td>6,439</td>
</tr>
<tr>
<td>Egf receptor antibodies (SD, 1983)</td>
<td>5,750</td>
</tr>
<tr>
<td><strong>Subtotal (top five inventions)</strong></td>
<td><strong>43,288</strong></td>
</tr>
<tr>
<td>Biodegradable implant Coils (LA, 1998)</td>
<td>4,429</td>
</tr>
<tr>
<td>Camarosa strawberry (DA, 1992)</td>
<td>2,666</td>
</tr>
<tr>
<td>Cochlear implants (SF, 1979)</td>
<td>1,735</td>
</tr>
<tr>
<td>Firefly luciferase (SD, 1984)</td>
<td>1,645</td>
</tr>
<tr>
<td>Chromosome painting (LLNL, 1985)</td>
<td>1,598</td>
</tr>
<tr>
<td>Energy transfer primers (BK, 1994)</td>
<td>1,578</td>
</tr>
<tr>
<td>Nicotine patch (LA, 1984)</td>
<td>1,116</td>
</tr>
<tr>
<td>Feline AIDS virus diagnostic (DA, 1986)</td>
<td>1,041</td>
</tr>
<tr>
<td>Ventana strawberry (DA, 2001)</td>
<td>908</td>
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<tr>
<td>Liposome storage method (DA, 1984)</td>
<td>867</td>
</tr>
<tr>
<td>Fluorescent dyes—calcium (BK, 1984)</td>
<td>854</td>
</tr>
<tr>
<td>Laser/water atomic microscope (SB, 1989)</td>
<td>735</td>
</tr>
<tr>
<td>Magnetic resonance imaging (SF, 1976)</td>
<td>715</td>
</tr>
<tr>
<td>Universal oligonucleotide spacer (BK, 1996)</td>
<td>577</td>
</tr>
<tr>
<td>Aids for learning disabled (SF, 1994)</td>
<td>573</td>
</tr>
<tr>
<td>Diamonte strawberry (DA, 1996)</td>
<td>514</td>
</tr>
<tr>
<td>Fluorescent conjugate probes (BK, 1981)</td>
<td>492</td>
</tr>
<tr>
<td>Human cytomegalovirus diagnostic (SD, 1982)</td>
<td>484</td>
</tr>
<tr>
<td>Novel phosphorus fertilizers (RV, 1990)</td>
<td>363</td>
</tr>
<tr>
<td>Radionuclide imaging method (SF, 1989)</td>
<td>324</td>
</tr>
<tr>
<td><strong>Total income (top 25 inventions)</strong></td>
<td><strong>66,502</strong></td>
</tr>
<tr>
<td><strong>Total income (all inventions)</strong></td>
<td><strong>93,500</strong></td>
</tr>
<tr>
<td>Percentage of total from top 5 inventions</td>
<td>46.3%</td>
</tr>
<tr>
<td>Percentage of total from top 25 inventions</td>
<td>71.1%</td>
</tr>
</tbody>
</table>

This list is limited to revenue-generating inventions that have been commercialized.

minority of research activities. The rest of the published knowledge would result in public benefits that could not be harvested and captured by any one firm or group of firms: this included most public health knowledge, as well as research in scientific fields like geology and mathematics. New algorithms in conjunction with empirical geological science might improve earthquake prediction, saving countless lives and perhaps much property damage, but the amount of money a particular firm might make (training personnel in interpretative techniques, packaging and distributing software) would be minute by comparison.

Because overall profits for even the most important discoveries are negative to small, and because blockbuster patents can never be predicted or planned, universities cannot base research or other programs on tech-transfer income. Universities cannot steer research programs on the basis of explicit financial incentives. No office of research that seeks to support a range and diversity of research—a broad, complex intellectual enterprise—can make funding decisions with licensing goals uppermost in mind. This is just as well, since, to repeat, the market value of nearly all socially useful research is a fraction of that research’s social value. The larger value of the research enterprise cannot be discerned by focusing on market outcomes.

Most practitioners understood these facts. By the 2000s, many technology managers were moving away from simple monetary defenses of tech transfer toward more developed discussions of benefits for research consortia and partnerships and for society as a whole. But much damage remained to be undone. Without intending it, tech-transfer advocates had generated their own culture-wars discourse, one in which tech transfer could best be measured in market terms and was, at the same time, evidence of the value of market incentives. Tech transfer thus dovetailed with the efforts of culture warriors to show that educational aims should be subject to the vision and rules of the marketplace. Most policy makers, encouraged by narratives emerging from the tech-transfer community, defended technology transfer as a direct service to market expansion structured by financial incentives.

In so doing, most tech-transfer advocates misstated the actual market outcomes of technological research. They undermined arguments for public support and open communication of research results. They made it harder to work out equitable compensation for participants who were at a distance from the licensing, start-up, or other transfer arrangements. They distracted attention from the long-term public value of this research. They
weakened interest in transfers that avoided exclusive licenses to individual companies. They did not properly conceptualize or fund research consortia based on intellectual property pooling and nondiscriminatory licensing. They tied academic research to market measures of success in spite of the evidence that this would not improve research and might actually damage it. In the dot-com period and its aftermath, when it might have become clear that market measures were failing technology transfer, tech transfer, within the gravity field of the culture wars, became a discourse devoted to markets.
Market thinking saw cultural disciplines as second-class: they made no money now and obviously never would. This assumption was as pervasive in academia as it was in business itself, and was blandly assumed by administrators, scientists, and humanities scholars alike.

But in the real world, science made no money either. That is, basic research cost money, enormous amounts of it. Science made money once it had been developed into commercial products, but that was a separate process that occurred almost entirely outside the university. Product development was also a net money loser in most of its early and pivotal stages. The culture of start-up companies reflected this fact with its folklore of “burn rates,” as companies raced their technology-development process against a money clock that was always threatening to run out. The gap between an exciting technological breakthrough and a successful product became famously large and famously difficult to cross: during the technological boom years of the 1990s, a popular technological determinism that asserted the inevitable profitability of new technology was flattened by serious pro-tech critiques like The Innovator’s Dilemma and Inside the Tornado.¹ Science cost money and technology cost money and money would be earned only well down a development road that would not be traveled by the university itself.

This statement flies in the face of two entrenched dogmas on university campuses. The first of these is that scientific research brings in money from the outside, and therefore earns money for the university. The second is that fields that cannot obtain much extramural funding—qualitative disciplines like art history and cultural anthropology—cost money and are a liability. We have already encountered these dogmas embedded in misleading dichotomies like “love versus money.” Now I need to suggest why both
dogmas are wrong, and how correcting them challenges core culture-warrior doctrine.

Social Value Minus Cultural Knowledge

First, let us recall this doctrine. The culture wars described the market as the sole repository of collective economic wisdom, and as a result academia’s ties to industry were readily cast as intrinsically valuable, as a sign of academia’s new willingness to reform and change, and as the main source of value creation. In contrast, disciplines that focused on basic skills, on the past, on difficult and controversial social and cultural domains, meaning fields like sociology, anthropology, history, literature, philosophy, music, drama, classics, and linguistics, in short, studies of the whole spectrum of human life and culture summed up in French academia as the “human sciences,” lost money, caused trouble, and were not seen as part of society’s economic engine. When that engine faltered cultural study could be cast as an expensive luxury; resources should, in culture-war doctrine, be diverted to the rock face of technological innovation.

This doctrine appeared unintentionally in various domains: in accounts of technology transfer, as we have seen, and even in official descriptions of the university’s social importance. For example, sometime after the year 2000 the University of California’s main Web site came to feature a link to an elaborate list of UC contributions to the California economy. This made good political sense: universities were trying to talk to state legislators in their basic language of economic gain. Thus UC president Robert C. Dynes noted that “our research leads to an average of three new inventions every day, and the UC system leads the American higher education community in the generation of new patents. Those innovations lead to new products; the products lead to the creation of new companies and even new industries; and those companies generate good, new jobs for Californians.”

But it turned out that only some fields were part of this economic contribution. UC commissioned a report about UC research called “California’s Future: It Starts Here.” Though the report ran 374 pages, the humanities and social sciences were all but nonexistent in it: sociology and anthropology, the “Democrat” disciplines in culture-war surveys of faculty politics, did not appear once. The fairly quantitative field of political science was equally invisible, though one would think it might have made contributions to understanding the famously dysfunctional California political system
that helped necessitate the report in the first place. Though the state’s racial
diversity was arguably the single most important determinant of its present
and future direction, cultural, ethnic, racial, sexuality, and gender studies
did not make an appearance. “Arts and Culture” showed up in the report as
public service programming. They also appeared in a section on “Quality
of Life Impacts,” along with “community outreach and volunteerism,”
“athletics and recreation,” and “conference services and housing facilities.”
The word “literary” appeared in the entire report exactly once, in the following
sentence about a public art installation at UCSD: “Projects include Terry
Allen’s ‘Trees’—three preserved eucalyptus trees encased in metal, individu-
ally known as the Music Tree, Literary Tree and Third Tree—installed be-
tween the Campus Library and Faculty Club.”

Though the official report was right to note that UC contributed to the
aesthetic and recreational lives of the public, it assumed that the human sci-
ences did not produce knowledge in the conventional sense and did not con-
tribute to the state’s economic development. In this sense, culture—and
cultural study—did not contribute to the state’s future.

Mysteries of Indirect Cost Recovery

The absence of cultural knowledge from notions of social value reflected
and reinforced the two dogmas that say that technology makes money and
culture loses it. The factual error at the heart of the story begins to appear
when we pause to look at indirect cost recovery (ICR). This is one of the least
appealing of university topics, but it is simpler and about ten times more im-
portant than it sounds. “Indirect costs” are little more than the overhead on
an activity, and in particular, on research. The standard situation is that a
university faculty member applies for and obtains a research grant from a
federal agency. If that person’s university has a 50 percent ICR rate, or over-
head rate, this means that 50 percent of the amount of the direct costs of the
grant will be charged to the agency in addition to direct costs. If a faculty re-
searcher obtains a grant of $100,000, an additional $50,000 will be given to
the researcher’s institution by the granting agency. The cost of the grant to
the agency will be $150,000, the researcher will have $100,000 to spend on
conducting the specific research, and the university will have $50,000 to
cover its overhead. Direct costs involve the costs of the specific grant—the
portion of the salaries of the principal investigator and research assistants
that are consumed by grant activity; buying equipment and materials to be
used in the research; and travel costs and similar expenses. Indirect costs go to the university primarily to pay “facilities and administrative costs . . . that are incurred for common or joint objectives and, therefore, cannot be identified readily and specifically with a particular sponsored project.” Clear examples are power bills, building maintenance, capital upgrades required by a number of research programs that share a building, environmental mitigation, and staff costs in the grant’s primary departments.

The actual formulas are often Byzantine, but the basic idea is that many of the costs of research are shared over a large number of grants and over a long period of time, and that each grant should pay for a piece of these common facilities and administrative structures. Everyone agrees that basic facilities are indispensable to the ongoing success of a university’s research operation: the university has to have the buildings and experienced staff in place before it can be a strong contender to get any grant money at all. Facilities and administrative structures must also be continually refreshed and upgraded if the university is to stay competitive. With modern science, these costs can be extraordinary: a building housing one unit of a school of engineering’s research operation can cost $100 million to construct, to say nothing of costs of operation.

The assumption that most observers make is that researchers apply for money that will cover all the direct costs of the research they propose. In addition, they assume that the negotiated rate of indirect cost recovery similarly covers the research’s indirect costs in terms of building maintenance, staff time, and so on. Once these assumptions are in place, the market view of university research takes hold: if both direct and indirect costs are covered by extramural grants, then administrators can transfer some ICR from the science departments that earn it to social science or humanities departments that do not. Administrators can do this either because ICR exceeds actual overhead costs so they can use the surplus to pay for other university expenses far from the origin of the grant, or, as most believe, because they skimp on expenses in the science departments (confiscating money that should pay for adequate staffing and proper facilities) so they can pay bills for the soft disciplines, which loses money. Making matters worse, scientists do face shortages and real deprivations. A significant campus research program may gross $100 million in federal contracts and grants, and generate around $50 million in overhead, and yet the science faculty that generate most of this money still cannot replace office furniture, hire clerical assistance, or repair leaky faucets—unless they pay for it directly from their grants.
But in practice the founding assumptions are incorrect. In many cases, the research’s *direct* costs are more than the agency is willing to pay to support them. An even worse story must be told about overhead, or *indirect*, costs. Accounting studies show that “research at [universities] is *not* fully funded by external funding sources.” The basic reason is quite straightforward: in order to help its faculty conduct research, the university allows and even encourages faculty members to accept grants from agencies that do not pay the full overhead costs of their grants. Such agencies include those of the federal government, where the negotiated ICR rate is almost always below actual overhead costs. Such agencies also include the many nonprofit foundations that have explicit policies of not paying full overhead. A third group of agencies is corporate partners, who can negotiate lowered overhead on a case-by-case basis. In UC, if sponsored research is classified as a gift—meaning it requires no reporting and no deliverables—its overhead rate can be as low as 2 percent. In other words, virtually no external sponsor of research pays its share of actual indirect costs. A UC Senate investigation concluded that “external studies of under funding have consistently put total recovered overhead at about 33% of modified direct costs—a dramatic shortfall as true costs appear to be in the 61–67% range.” This means that, on average, universities are recovering about half of their actual overhead costs.

Table 6 shows a sampling of ICR shortfalls. A few universities have minimized the gap between their actual costs and their negotiated rate of ICR, but most have not. The gap between actual and recovered costs would then be multiplied by the dollar amount of the research operation to yield the amount that scientific research actually costs each campus. Oddly enough, some of the largest gaps occur at some of the largest research operations in the country (Washington is always near the top in overall federal contracts, Harvard is a perennial front-runner, and the UC campuses as a whole have more than $2 billion just in federal contracts). If an “average” campus has $200 million in research, and the gap between actual and recovered costs is “only” 5 percent on a 50 percent negotiated ICR rate, the university needs to find nearly $7 million a year of its own money to cover the costs of conducting extramural research.

The actual situation, however, is generally much worse. The federal agencies listed in Table 6 are among those who come closest of all research sponsors to a full recovery rate; some percentage of research occurs with much less or even very little ICR. When all these sources are pooled together, the negotiated rate turns out to be far higher than the *actual overall* rate of
recovery, which at UC is only 33 percent. If the gap between actual and recovered indirect costs is not 5 percent as posited above but 50 percent, then the university needs to find ten times the subsidy money assumed above, or closer to $70 million of its “own” money. The actual gap is somewhere between these figures, but even if it hovers nearer the low end, such rough calculations suggest that the costs of research are a very serious chronic budgetary issue.

The clear conclusion is that extramural research is not a moneymaker for universities. Research is, to the contrary, a major cost, and is one of the important sources of the continuous above-average price inflation in higher education that torments parents by producing continuous tuition hikes.

**Table 6** Organized research facilities and administration rates, selected research universities

<table>
<thead>
<tr>
<th>University</th>
<th>Most recent submitted estimates of actual costs (%)</th>
<th>Negotiated recovery rate (%)</th>
<th>Cognizant agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvard University</td>
<td>72.9</td>
<td>67</td>
<td>HHS</td>
</tr>
<tr>
<td>MIT</td>
<td>69.2</td>
<td>65</td>
<td>ONR</td>
</tr>
<tr>
<td>Johns Hopkins</td>
<td>67.7</td>
<td>63.1</td>
<td>HHS</td>
</tr>
<tr>
<td>University of Washington</td>
<td>64.4</td>
<td>56</td>
<td>HHS</td>
</tr>
<tr>
<td>Stanford</td>
<td>58.8</td>
<td>56.5</td>
<td>HHS</td>
</tr>
<tr>
<td>Penn</td>
<td>58.5</td>
<td>57</td>
<td>HHS</td>
</tr>
<tr>
<td>University of Minnesota</td>
<td>53.6</td>
<td>49.5</td>
<td>HHS</td>
</tr>
<tr>
<td>Georgia Tech</td>
<td>50.5</td>
<td>50.3</td>
<td>ONR</td>
</tr>
<tr>
<td>Penn State</td>
<td>46</td>
<td>45</td>
<td>ONR</td>
</tr>
<tr>
<td>Utah State</td>
<td>40.2</td>
<td>42.4</td>
<td>ONR</td>
</tr>
<tr>
<td>UCSD</td>
<td>64.5</td>
<td>56</td>
<td>HHS</td>
</tr>
<tr>
<td>UCLA</td>
<td>60.7</td>
<td>54.5</td>
<td>HHS</td>
</tr>
<tr>
<td>UCSF</td>
<td>58</td>
<td>54</td>
<td>HHS</td>
</tr>
<tr>
<td>UCD</td>
<td>71.2</td>
<td>52</td>
<td>HHS</td>
</tr>
<tr>
<td>UCR</td>
<td>60.3</td>
<td>50</td>
<td>HHS</td>
</tr>
</tbody>
</table>

HHS, U.S. Department of Health and Human Services; ONR, Office of Naval Research.

 Courtesy of Charles Louie, vice chancellor for research at the University of California at Riverside, 2007. F&A data is available through a variety of resources, including the Council on Government Relations, web sites of universities, and a number of federal agencies who maintain this data. The data obtained here is publicly available, and no single organization is responsible for providing it.
Research does many other good things—it creates knowledge, enlightens humankind, improves long-term economic health, raises the quality of life, enhances the reputation, status, and social influence of the faculty, and allows the university to continue to get more grants to do more research. But scientists do not earn net income for the university through their grants. They do not send money over to the alleged money losers that populate the cultural fields. Although it is certainly true that administrators deprive grant getters by diverting a portion of ICR funds to cover expenditures at a distance from the faculty members who generated them, grants never earn enough to cover their own costs. And they never will. Many technical reports confirm this analysis, and some universities are honest about this, but most are not clear about the basic fact that “all research is subsidized research.”

We now turn to our next question: subsidized by whom?

**The Financial Contribution of Teaching Culture**

The most immediate answer is that research is subsidized by graduate students. They are paid relatively low wages and are easily hired and fired. Universities offer themselves and their industrial partners a large number of very bright, highly motivated young people who are trained in the latest techniques, and who are paid salaries that range between $15,000 and $25,000 a year. The research university thus offers corporate sponsors high-quality scientific labor at a fraction of its market cost. This helps explain science managers’ defense of the university’s distinctiveness even as many political and business leaders call for the university to be more like a business. Were the university really to be a business, it would in theory really have to pay market wages, meaning that it would have to pay young scientists and technologists like employees rather than like graduate students, and this would significantly increase overall research costs. (University technology managers tell me that their rule of thumb is that industry can cut its cost for high-risk, long-term research to about ten cents on each dollar it would spend in its own laboratories.)

The more general subsidy for research comes from the public, through the tax and tuition money that pays for teaching. General fund and tuition money flow to course enrollment in varying degrees, since both taxpayers and students are paying first and foremost for instruction. States normally appropriate money to public universities according to enrollment: some of the money pays direct costs of instruction like faculty and staff salaries, and some
pays indirect costs, like the building, equipment, administration, course materials, and utility costs that are part of the teaching enterprise. Private universities do something similar with tuition money: most have formulas to ensure the fair funding of teaching “workload.” As a result, departments that have lots of majors or enrollments generally get proportionally more money for faculty and staff salaries, more money for new hires, more teaching-assistant funds, and so on. States often set an amount that they will pay to instruct each student. The formulas can be arcane, but the basic idea is that allocations should generally reflect instructional load, especially since instruction has long been seen as the university’s core service to society.

What this means is that we can in principle calculate what individual departments or divisions “earn” based on their student enrollment. We can also find out what their actual budgets are. We can then see whether the university is actually paying every department what it earns through teaching, or whether it is getting more or less than what it expects to get for its teaching effort.

Table 7 offers one example of such a calculation. These are actual, though simplified, figures from a flagship state university with a complement of additional professional schools that I exclude here. The “earned” figures are a product of the division’s instructional load multiplied by the amount of public money that is sent by the state per student. The private university equivalent would be the tuition revenues generated by student enrollment. “Actual revenues” reflect what the university administration then really gives each division. “Research awards” refer to extramural contracts and grants from all sources, including industry. These figures include money for both direct and indirect costs, at various rates.

The normal way to read such a table is to look at the last column. When we add teaching revenue to research revenue, and then divide by the number of faculty FTE (not shown), we could apparently conclude that both sides of campus contribute funding in their own ways. The humanities and social sciences contribute with more teaching, and the sciences and engineering with more research. When you add the numbers in the last column, this story goes, “Funds generated” by engineering faculty are double those of the professional school faculty and more than double those in the human sciences. Natural and physical science faculty are in between, but closer to engineering. Hence, we seem to have learned yet again that science and engineering faculty earn the bulk of the money and then have to share a piece of it with their poor relations in the human sciences. Any administrator trying to maximize return
<table>
<thead>
<tr>
<th>Division</th>
<th>Earned instructional revenues</th>
<th>Actual revenues</th>
<th>Ratio of actual to earned revenues (%)</th>
<th>Research awards</th>
<th>Funds generated (total, including gifts)</th>
<th>Funds per faculty FTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional school</td>
<td>869,000</td>
<td>2,433,369</td>
<td>279.8</td>
<td>2,668,012</td>
<td>4,075,309</td>
<td>251,562</td>
</tr>
<tr>
<td>Arts and humanities</td>
<td>56,684,987</td>
<td>25,665,591</td>
<td>45.3</td>
<td>1,542,992</td>
<td>60,942,496</td>
<td>230,922</td>
</tr>
<tr>
<td>Social sciences</td>
<td>40,820,389</td>
<td>15,732,870</td>
<td>38.5</td>
<td>1,673,422</td>
<td>43,194,634</td>
<td>294,743</td>
</tr>
<tr>
<td>Natural sciences</td>
<td>40,336,121</td>
<td>30,309,471</td>
<td>75.1</td>
<td>55,437,901</td>
<td>97,870,016</td>
<td>400,811</td>
</tr>
<tr>
<td>Engineering</td>
<td>11,398,652</td>
<td>24,348,696</td>
<td>213.6</td>
<td>43,382,033</td>
<td>64,420,069</td>
<td>530,250</td>
</tr>
</tbody>
</table>
on investment would think, according to this logic, that she should stop hiring literature professors and only hire engineers.

But if we look at the fourth column, “Ratio of actual to earned revenues,” we see a more startling picture. Were the sciences subsidizing the social sciences and humanities, one would predict departmental budgets in the latter divisions that are larger than what these departments earn through their teaching. A department like English or art history would, according to this standard assumption, keep its teaching money, hang on to the tiny scrap of ICR it may generate with its minute grants, and then extract some ICR money from a science or engineering grant on top of that. In reality, the opposite is the case. At this particular public university, humanities and social science departments keep only a portion of their enrollment money, less than one-half and one-third, respectively. The sciences do somewhat better but are not at 100 percent. By comparison, engineering receives double its teaching workload money. The professional school receives closer to three times its workload money. Were this a medical school, the gap would be far larger—each student could receive six to ten times the allocation for the general campus student. It is worth reflecting on the lessons of column 4, and not just on the more familiar lesson of the final column.

The lessons of column 4 can be generalized as follows: First, if these figures are at all typical, humanities and social sciences disciplines are not getting a piece of the science and engineering action, but are sending a piece of their action to the sciences and engineering. The human sciences cannot generate much external support, and thus depend largely on teaching revenue. They teach more courses than science faculty and conduct their research on the margins of their workweek and in many cases out of their own pockets. To make this situation worse, the university represented in Table 7 takes a portion of the human sciences teaching money and gives it to the sciences. In this case, this is not a small slice: it is half of the humanities instructional money and close to two-thirds of the social sciences money. Topping it all off, the university lets everyone think that the science and engineering fields that are getting such a large share of human science teaching revenues are in fact the generous if sometimes unhappy subsidizers of the “soft” fields. It appears that the humanities and social sciences are major donors to science and engineering budgets, while being told that they are actually living off those budgets. In other words, both dogmas about university research are wrong. In fact, science and engineering cost money, and humanities and social science teaching subsidize it.
Second, humanities and social science students receive a cheap education, one in which they get back less in terms of fees than they put in. Some of the differences are justified by the higher costs of instruction in fields like chemistry, which require laboratory equipment that fields like economics do not. (This is the number one retort to the analysis I have just offered, and it is true to a point: the costs of instruction are higher in bench sciences. But much of that difference is in research costs, and in any case this does not change the fact that the money arrow flows to, and not away from, science and engineering.) The “higher costs” rationale can and does slide over into justifications for sometimes gross inequalities in equipment, ones in which fields like music and art history cannot afford new practice instruments or digital projectors. The assumption developed over many years that the arts, humanities, and social sciences do not need great equipment comes to guarantee that they never have it. Their students learn to do without, and in the absence of some vital forms of technology, may learn less than they otherwise would. The myth of the science subsidy underwrites the second-class education that many if not most public university students receive in cultural and social disciplines.

Third, the arts, humanities, and social sciences are being underdeveloped relative to their social and even their financial capacity. The greater infrastructural costs in science and engineering should not be allowed to conceal the fact that the arts, humanities, and social sciences would be much stronger locally and nationally were they to keep more of “their” enrollment money. Drama and music departments, for example, tolerate dilapidated conditions that would be unthinkable in any self-respecting engineering department: first-rate soundstages, rehearsal areas, digital playback equipment, lighting, and a tripling of staff could turn a mediocre drama department into a national center of innovation in its field, and would in addition attract the kind of private philanthropy that more often flows into science and engineering. But a hierarchy of needs is ingrained in university culture. The humanities and social sciences generally ask for trickle-down funding from other divisions, even though much of that money was “theirs” to begin with.

I say all this not to foment class war between the arts and sciences. The disciplines are complementary, their faculty members largely agree on educational matters, and science and engineering research requires more, not less, funding to do what it needs to do. But, to sum up these points, we do need to realize the following: First, the common view that market-oriented
fields earn while sociocultural fields take is false. Second, the humanities and the social sciences have a legitimate claim to a larger share of such a university's resources, even in market terms based on their earnings from their "customers," the students. Third, the sociocultural fields are direct financial contributors to the financial base for technological R & D and to technological progress as such. This contribution should be acknowledged and honored—and also correctly compensated.

Finally and most broadly, even the market power of the innovation system is being threatened by misplaced market values. By equating commercially oriented research in technology with profitability, and culture with cost, culture warriors helped obscure the budgetary reality that successful tech research depends on public subsidies—subsidies funneled in some significant part through teaching in cultural fields. Quite to the contrary, culture warriors helped persuade policy makers that public subsidy for basic research was not so necessary, since science, once given the incentive to produce for business, would more than pay for itself. Policy makers were happy to believe this tall tale, since it justified their continued cuts in public outlays for higher education. As a result, the country has been less prepared than it otherwise would have been to pay openly and publicly for the breakthrough science or the new industries that might have given it a step-function advantage over its global competitors. Marginalizing cultural study on ideological grounds and then obscuring its economic value, while simultaneously denying the central role of public life and public funding to economic progress, culture warriors shot their own economic goals in the foot. The culture wars fed the odd decadence of the current situation, in which hidden teaching subsidies in cultural fields veil the rot left behind by falling public support—even if only temporarily.