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**INDUSTRY, PHILANTHROPY, AND UNIVERSITIES:
The Roles and Influences of the Private Sector
in Higher Education**

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ABSTRACT

Charles Vest gave the third of three Clark Kerr Lectures on the Role of Higher Education in Society on September 13, 2005 on the Berkeley campus. In public as well as private universities, resources provided by philanthropic individuals and foundations and by corporate research sponsors increasingly support the margin of university excellence, and increase the access of students to that excellence. The congruence of interests, goals, and expectations of philanthropists and corporate sponsors with those of universities must be carefully considered. The values of excellence and access frequently come into conflict as schools decide how to award student financial aid from gifts and endowments on the basis of merit or on the basis of financial need. Despite such interesting and important challenges, the generosity of individuals and foundations and the support of far-sighted corporations and industry consortia are central to maintaining and enhancing America's outstanding system of higher education.

Perspectives and experiences change with time and over generations. In the early 1960s, Clark Kerr articulated the rapid metamorphosis of our research universities into something new and different. Campuses sprawled intellectually even as they sprawled physically across the landscape of state after state. As they evolved, they developed a complex web of purposes and created increasing tensions between societal utility and what had always been considered to be academic purity.

The multiversity as I have experienced it – as a student, as a professor, and as an administrator – is a noble and enabling place. What appeared to many in 1963 to be sources of tension, cross-purposes, and potential conflicts of values and interests have been for me a great web or mosaic to be savored and celebrated. It was what I expected a university to be. And, despite the passage of forty years, it still is.

Today, the multiversity contributes to society through a wide spectrum of activities, ranging from the ancient and honorable roles of academia as discoverer, conservator, interpreter, and transmitter of knowledge, values, and understanding; to additional contemporary roles as creator of opportunity for young men and women; developer of new technologies, processes, and even products; and partner with governments, industry, and philanthropists to directly contribute to the advancement of economies, security, health, and quality of life.

As universities pursue these new roles, especially in their scientific and technological contributions to economic development, they are at the nexus of five interested parties whose expectations are frequently mutually orthogonal. *Students* are attracted to science and engineering by curiosity, awe of nature, and the excitement of the unknown. *Researchers* are driven by “fire in the belly” and obsessive concentration on solving challenging puzzles. *Legislators* at all levels believe that tax dollars should produce jobs. *Industry* wants faster and faster innovation. *Donors* want universities that implement their personal worldviews.

Through an increasingly complicated, and largely implicit, integration of federal and state policies and appropriations with academic mission and means, we try to bring some coherence and synergy to these seemingly disparate aspirations. In my first lecture I concentrated on the role of governments. My purpose today is to address the private-sector role by exploring a few of the many interesting and continually changing interactions of universities with both industry and philanthropic individuals and organizations. It will draw considerably on my personal experience, so I claim no comprehensiveness. I will first address issues regarding industry and universities and then turn to the role of philanthropy.

Industry

U.S. corporations and corporate foundations have been a significant part of our national philanthropic community for several decades. In 2003, they made cash and in-kind donations estimated at \$13.6 billion, of which 11 percent supported higher education.¹ The purposes and nature of donations to universities and other nonprofit entities have varied widely across companies and over time; however, it is fair to say that, increasingly, donations are targeted at activities and institutions that are directly relevant to the companies or industries. For example, among the largest recent donations has been the approximately \$40 million per year in cash and over \$200 million in software that Microsoft has donated to nonprofit organizations. Such donations accomplish a lot of good and also expand potential applications and software markets in the long run. In general, the blend of philanthropic intent, public relations, capacity building, and social agenda behind corporate giving is complex, as is the tax and regulatory environment in which it operates. Although the distinction is not always clear-cut, I will concentrate here on direct university-industry interaction in research and education, rather than on corporate philanthropy.

If one simply looks at industry as a source of support for research in U.S. universities, its role appears to be modest. In 1953, industry funded approximately 9 percent of

¹ The Center for Philanthropy at Indiana University, *Giving USA 2004* (Indianapolis: Giving USA Foundation, AAFRC Trust for Philanthropy, 2004) p. 83, and Figure 1, p. 87.

American academic research, and the federal government funded about 55 percent. Then came the golden era of federal support, driven in large part by the national reaction to the Soviet Union's launch of Sputnik. Between 1960 and 1967, federal support grew to 75 percent of the total, and industry dropped to only about 2 percent. Since the mid 1980s, industry support has been quite stable at about 8 percent of the mix, while federal support accounts for about 60 percent.² In other words, for decades, industry has funded less than 10 percent of university research. But this belies both the importance and the complexity of the research relationship between academia and industry today.

The comparative advantage of the United States in world competition is our combination of a strong R&D base and a free-market economy. Companies and universities have critical and intersecting roles in maintaining this advantage and building upon it. The relationship between academia and industry is therefore of fundamental importance.

The evolving relationship between industry and academia can be viewed in the context of the U.S. *innovation system*. This is effectively a loosely coupled interaction among universities, governments, and industry that creates new knowledge and technology through research, educates young men and women to understand and extend it, and moves it to the marketplace in the form of goods and services. The traditional role of universities, especially their schools of science, engineering, and business, in this innovation system is relatively straightforward, but the pace of technological change, together with the forces of globalization and international competition, will almost certainly change the traditional university role substantially. We in research universities are experimenting and, at minimum, should continue to experiment carefully with new models of industry partnership and innovation.

Our role in the U.S. innovation system will only increase in importance. As Alan Greenspan has stated, "In the 21st century, our institutions of higher learning will bear the enormous responsibility of ensuring that our society is prepared for the demands of rapid economic change."³

The traditional role of universities in the innovation system has its origins in Vannevar Bush's report *Science, the Endless Frontier*, to which I referred in my first lecture. This report is the basis of the unique and highly successful partnership between the federal government and our universities that has served our nation so well since the end of World War II. The model derived from this report is one in which our public and private universities are the nation's primary infrastructure for basic research. For decades, this stood in contrast to most other nations, although more countries are now moving toward our model. The federal government funds research in our universities, ideally selecting projects on the basis of intellectual merit to be carried out in large measure through the work of graduate students, and also contributes a fair share of the capital and administrative costs of doing that research. The federal dollars expended in this way do double duty: they support the quest for new knowledge and technology and

² "Survey of Research and Development Expenditures at Colleges and Universities, Fiscal Year 2002," National Science Foundation, 2004 (Table B-1).

³ Remarks by Alan Greenspan at the International Understanding Award Dinner, Institute of International Education, New York, NY, Oct. 29, 2002, <http://www.federalreserve.gov/boarddocs/Speeches/2002/default.htm>.

simultaneously support the education of the next generation of scientists, engineers, doctors, and other researchers. The system is elegant, simple, and effective.

Although the Vannevar Bush model addresses the federal government and academia, it implies a particular two-part relationship between universities and industry to achieve the goal of using science to advance our national economy, security, health, and quality of life. First, it creates a knowledgeable workforce to work and lead in industry, bringing with it new ideas and technological capabilities. As John Armstrong, former vice president for research of IBM, likes to say, "The best vehicle for technology transfer is the moving van."

Second, the Vannevar Bush model seems to assume that there is a linear progression from basic research to development to product and marketing, and that these components can be carried out separately in two or more organizations. And it is a *laissez-faire* model in which the commercial applications of university research are left more or less to chance. Universities do the basic research, and industry may choose to commercialize it.

This approach has had phenomenal success over time. Economists broadly agree that about 50 percent of the growth of the U.S. economy during the last sixty years has been due to technical innovation, much of which has originated in university research

During the approximately forty-five year period following the end of World War II, the multiversity so eloquently described by Clark Kerr became the world's powerhouse for basic research in the sciences and engineering. During those same forty-five years, American industry led the world in almost every conceivable dimension, especially in mass production and in bringing new technologies to products and services. Big corporations largely dominated this era. Most developed massive central research laboratories that attracted many of the best graduates of our universities and conducted outstanding research. While emphasizing applied research of relevance to their companies, these laboratories also conducted fundamental research and contributed to the commons of scientific and technological knowledge through open publication and participation in the scientific community.

In the mid 1980s, two tectonic shifts occurred. First, American technological entrepreneurship expanded explosively, driven mostly by advances in information technology based on microprocessors and the Internet and later by biotechnology. Second, Japanese companies began manufacturing products with levels of quality, throughput, and product cycle times that left most U.S. manufacturing companies simply unable to compete effectively in world markets. (The Japanese also became remarkable innovators, introducing world-changing products like the compact video recorder and the Sony Walkman.)

America's manufacturing companies struggled to survive through painful and very basic transformations. They placed new emphasis on process management and quality control, flattened and thinned their organizations, totally reworked their product-development systems, merged research into product development in a very nonlinear manner, and eliminated the vast majority of their fundamental research and contributions to the commons of science and technology. In the end, many of these companies emerged strong and competitive. But the national innovation system had changed fundamentally. Our companies had become efficient, competitive, high-quality

manufacturers, and our universities were better than ever at doing basic, or curiosity-driven, research, but many traditional linkages between them had changed.

Companies got less and less substantial innovation from their own research and development activities, which were focused on critical, though incremental, change. Rather, they pursued more and more innovation by purchasing small, entrepreneurial companies that had developed a product or process they needed. Universities, or at least university people, became major players in this system because their recent graduates or faculty formed many of the entrepreneurial companies. Frequently our role was even more direct, enabled by the Bayh-Dole Act of 1980 that awarded to universities patent rights to inventions made in the conduct of federally sponsored research. University patent-activity and technology-transfer staffs flourished.

This period saw a number of changes and experiments in the relationship between universities and industry. First, engineering education began to change. Many of us concluded that academic engineering had grown too far from its industrial roots and that we had a responsibility to our students, and within our social contract, to modify our direction somewhat. Increasingly, engineering and business schools joined forces to develop both curricula and research programs in areas like modern manufacturing, product development, and entrepreneurship. A subset of faculty found intellectually challenging new problems posed by fast-paced, global, digitally-connected industries.

For MIT, establishing the Leaders for Manufacturing Program (LFM) ushered in this period of change. LFM was established as an educational and research partnership among industry, the School of Engineering, and the Sloan School of Management, with one co-director from each partner. It initially had eight corporate partners from several different manufacturing sectors – such as aerospace, automotive, electronics, and medical products – each of which provided several million dollars of financial support and also committed professional effort to joint projects. Our experience with this program taught us several important lessons, among which are an understanding that when companies provide large financial support, the university gains effective access and working relationships with their leaders and best thinkers; that interdisciplinary and inter-school programs can be successful; that knowledge transfer from academia to industry can be accelerated; and that academicians can contribute directly and effectively to solving problems posed by today's industry that are stimulating, challenging, and important.

Corporate-University Research Partnerships

During the 1990s, we established a small number of partnerships with individual companies, each in a different industrial sector. Their intent was to work in challenging research areas of mutual strategic interest to MIT faculty and to the company. Each partnership was supported at a level of roughly \$5 million per year with an intended life of at least five years. They were intended to fill a void in U.S. research created by the demise or transformation of so many corporate research laboratories, to stimulate change and renewal in engineering and management education, and to diversify our portfolio of research support that in my view had become overly dependent on federal funding.

Most of these partnerships were established by a commitment at the corporate level, usually by the CEO, that such a partnership would be funded if the faculty from the

university, together with technology and thought leaders in the company, successfully defined an important research program that clearly added value to both organizations. Thus there was a *potential* top-down commitment, but – and I must strongly emphasize this – it would come to fruition only through bottom-up faculty interest and commitment. That is a *sine qua non*.

These partnerships were established in areas such as the environment, biotechnology, advanced information technology, financial engineering, and biologically-based materials. Partner companies included Amgen, Merck, Ford, NTT, Merrill Lynch, DuPont, Microsoft, and Hewlett-Packard. Over time, several interesting characteristics evolved. All of these partnerships engaged multiple academic departments, and indeed multiple schools, and all ended up with significant educational objectives – development of new courses and pedagogy, as well as student support. Another characteristic was summarized by an outstanding biology professor who wrote, “Without this industry support, my lab would be doing nothing really new, because our federal support has become so risk averse.” Those partnerships that worked really well did so when a high level of trust and mutual respect developed between the university and industry participants, and when there was a clear understanding of the differing goals and time frames of the two organizations.

On the other hand, such major industry support was viewed by most faculty participants as requiring high maintenance. Its renewal also was to some extent captive to the ups and downs of the company’s economic fortunes. Sometimes the quality or longevity of the partnerships diminished when company leadership changed. Several partnerships, though not all, were mutually judged to be very successful and have been extended well beyond the initial commitment.

A common concern is whether such major interactions and support distort the mission of the university. Good people may well disagree on this. My own view is that they expand the intellectual opportunity space in which some faculty and students engage in a very positive way, and that faculty will not permit anything they consider to be distortion. A faculty-wide survey and study of the partnerships was conducted in 2002, and it concluded that while many people worried that such distortion might occur, no one could cite an instance in which they believed it actually had. Finally, what about intellectual property? This was a major issue in negotiating agreements, but MIT’s industry partnerships are conducted within our normal policies on intellectual property.

Intellectual Property

Universities hold dear their role in discovering and disseminating knowledge. The underlying assumption is that what we do on our campuses is, or should be, of general value to society and should be shared openly to advance humankind. Thus there can be a tension with the fact that much of what we generate, especially in science and engineering, has economic value, i.e., it is intellectual property with financial value to which the inventor and the institution have legitimate claim. Unfortunately, in my view, some universities maintain unrealistic expectations about striking it rich through patent royalties and have tended to be overly protective and difficult when it comes to negotiating sponsored research agreements. But on the whole, sensible management of intellectual property is a plus in our interaction with society.

Companies, on the other hand, must compete to create value for their customers and financial gain for their stockholders. Therefore they have an interest in holding closely both the knowledge and techniques that give them a competitive advantage. Patent ownership is a tool both for protection of their competitive advantage and for maximizing profits, by charging for their use, and for avoiding paying royalties to others, including universities.

The time from fundamental discovery to commercialization has decreased dramatically in many fields, and margins of competitive advantage have become very small and fleeting in many fast-paced industries. It also must be recognized that views on this topic seem to vary, largely based on the maturity and scale of the industry in question. It is also generally the case that discussions with industry leaders at the highest ranks within corporations seem to be much more flexible than with those at the operating level who are involved with making project-level decisions.

Universities' approaches to patents should be designed primarily to encourage the transfer of technology to the private sector. This requires an ability to negotiate with industrial sponsors as equals, best accomplished, in our view, by ownership of intellectual properties produced by campus researchers coupled with flexibility in reaching agreements with sponsors about licenses. When projects are large, such as the strategic partnerships I discussed, the negotiation process seems to work well. However, I believe we would be well served to establish a voluntary, nationwide standard agreement for more routine industry-sponsored research projects.

Knowledge Integration Communities

A quite different model for industry-university interaction is developing within the Cambridge-MIT Institute (CMI). CMI is a unique alliance of Cambridge University and MIT funded primarily by the UK government, initially for six years. Industry also supports CMI through sponsorship of specific research projects. The mission of CMI is to enhance the competitiveness, productivity, and entrepreneurship of the UK. It is to do so by improving the effectiveness of knowledge exchange between universities and industry; educating leaders; creating new ideas; developing programs for change in universities, industry, and government; and building networks of participants beyond the two universities.

The formation of *Knowledge Integration Communities* (KICs) for CMI research projects is an attempt to enhance feedback and efficiency through knowledge exchange, and to do so in a manner that elicits enthusiasm among the academic researchers who do the creative work. In other words, CMI research is intended to generate fundamental new ideas that are developed with some explicit consideration of potential use and an eye toward the needs of industry.

The stakeholders who comprise a KIC typically include academic researchers, industry participants from large and small companies, government policy makers, special interest groups such as regional development authorities, and educators from a variety of institutions, who come together to pursue a common science, technology, and social end goal. Although this broad involvement runs counter to many academic instincts, it appears to be working rather well because considerable thought and effort have been put into the process and because the concept itself arose out of careful discussion and iterative planning among the stakeholders. I believe their initial success also reflects the

fact that the topics of the research, such as silent aircraft, quantum computing, and next-generation drug discovery, are truly exciting and challenging.

CMI's Knowledge Integration Communities are works in progress. More years of experience will be required to rigorously evaluate their effectiveness. Indeed, the hope and intent is for KICs to develop into long-term, self-sustaining activities.

Louis Pasteur famously observed, "Chance favors the prepared mind." I consider that the goal of Knowledge Integration Communities is to support excellent fundamental research, but also to create a *collective prepared mind* of multiple stakeholders that enhances the probability that results will find positive industrial application. This is a way of operating in what Donald Stokes dubbed Pasteur's Quadrant.⁴

Despite my enthusiasm for meeting academia's responsibilities as part of our national innovation system, I also believe that we must take great care as we develop new relations with industry so that universities do not assume a posture that is too utilitarian. In time this would erode their intellectual independence and their ability to serve as objective critics of society. Indeed, there is a paradox in that it is this very independence and objectivity that usually attracts industry to work jointly with academia. The right balance must be struck. As we work together in areas that have policy implications, such as the environment, energy, telecommunications, and productivity, we must maintain our independence and objectivity. Thus, it is in the best interests of both parties that these matters be addressed carefully and resolved.

Philanthropy

Milton Eisenhower, president of the Johns Hopkins University from 1956 to 1967, is said to have had a very concise fundraising speech: "Gentlemen, it takes good men to make money, and it takes money to make good men."⁵ Needless to say, today our society, universities, philanthropy, and gender roles – as well as fundraising speeches – are not so simple! But the fundamental implication that higher education prepares men and women to advance society, and that this worthy activity costs money, certainly is true today.

The Growing Importance of Gifts and Endowment

In an ideal world, one might imagine that private colleges and universities would derive all of their revenue from two sources, tuition income and gifts plus the annual return from a sizable endowment. Public institutions would derive all of their revenue from tuition income and state appropriations.

But today this is a pipe dream. The fact is that both public and private colleges and universities require significant fractions of their support from individuals and private organizations, including gifts and income from endowment. For example, consider the sixty-two leading research universities belonging to the Association of American Universities (AAU). According to a recent study, the distribution of annual *expenditures*

⁴ Donald E. Stokes, *Pasteur's Quadrant: Basic Science and Technological Innovation*, Brookings Institution Press, Washington, DC, 1997.

⁵ See <http://cybernation.com/quotationcenter/quoteauthor.php>.

of the public and private AAU universities are remarkably similar: 34 percent for instruction and 23 percent for research in the privates; and 32 percent for instruction and 25 percent for research among the publics.⁶

But what are the sources of *revenue* for these activities? Twenty-two percent of the annual revenues of the private AAU universities, excluding their hospitals, comes from private gifts, grants, and contracts, while 20 percent comes from tuition net of financial aid, and 25 percent comes from federal, state, and local government grants and contracts. (The remaining 33 percent comes from auxiliary enterprises, sales, services, and miscellaneous sources.)

Of the equivalent annual revenues of the public AAU universities, excluding their hospitals, 9 percent comes from private gifts, grants, and contracts, while 13 percent comes from tuition net of financial aid, and 31 percent comes from federal, state, and local government appropriations. As indicated by these statistics, and as discussed in some depth in my lecture here at Berkeley last spring, many leading public universities are rapidly becoming very dependent on private-sector support, and indeed elements of several of these universities are actually or effectively privatized. In any event, the continued excellence of both our public and private universities – and access to them for students of modest financial means – will be increasingly dependent on private philanthropy.

Thus a fundamental question is whether many state universities will be able to establish endowments equal to the task. In 2002, only \$61 billion, or 27 percent, of endowment holdings were in public universities, while the privates held \$161 billion, or 73 percent.⁷ The asymmetry is much greater than these numbers imply because the public institutions enroll a vastly greater number of students than do the privates. Nonetheless, there are suggestions that the likely answer is yes, over time, many state universities could build substantial endowments. A recent analysis of college and university endowments exceeding \$200 million indicates that the endowments of public institutions are growing at a faster rate than the endowments of the private schools.⁸ Why?

Consider the apocryphal story about an American tourist who visited one of the ancient colleges of Oxford and admired its beautiful and perfect lawns. He asked a groundskeeper to tell him the secret of developing such a perfect lawn. The groundskeeper thought for a few minutes and replied, “Well, it’s simple. You just water it, weed it, and roll it ... for about 800 years.”

We tend to think of university endowments in the same way, that to be large they must be very old and that they grow primarily by effective investment and spending policies. While this is true to an extent, the fact is that endowments grow almost as much by the annual addition of gifts as they do through investment, and it appears that the publics are adding gifts at a relatively faster rate than the privates. In the sample noted above, averaged over the years 1999-2004, the public institutions added about 5 percent of

⁶ *Finances of Research Universities* (Washington, DC: Council on Government Relations, November 2003).

⁷ National Association of College and University Business Officers, *2002 NACUBO Endowment Study*, <http://www.nacubo.org/documents/research/Surviving%20Endowment%20Drought.pdf>.

⁸ G. P. Strehle, Addendum to “Sources of Endowment Growth at Colleges and Universities,” The Commonfund Institute, 2005.

their endowments' market values each year, while the privates added about 2 percent of their market value.

One can speculate on the reasons for this, including scale of donor base relative to endowment size, differences in how capital projects are funded, etc. But there are two clear messages. First, annual fund raising is very important, and second, in a few decades we can anticipate some well-endowed public institutions if they set that as part of their strategy.

A Dynamic and Challenging Environment for Fund Raising

Given this growing importance of fund raising, we should examine the dynamic and challenging environment in which it must be accomplished.

During the last two decades we developed a knowledge-based economy. Innovation and entrepreneurial activity drove more and more of the growth of both employment and equities, and we simultaneously leveled or reduced tax rates, and frequently reduced public services as well. The purpose of this is to drive economic growth. Associated with that growth is an implied responsibility of the business sector and of individuals whose wealth grew dramatically to voluntarily bear more of the costs of critical social goods including, in my view, education.

Is this happening? Is there the requisite staying power of private support for colleges and universities whose capabilities and excellence must be sustained for a very long time? Is there an unacceptable volatility of philanthropic support that is incompatible with our university mission? And will there be an appropriate long-term match of donors' values and goals with the values, goals, and core needs of the academy?

We are at least off to a good start. Philanthropic support of higher education in America is continuing to grow. Between 1994 and 2004 annual voluntary support of higher education grew by 94 percent in constant dollars; even when normalized to the growing number of enrolled students, it still grew by 84 percent.⁹ Throughout this period, about half of the giving was by individuals, roughly equally divided between alumni and non-alumni. The other half of the gifts came from corporations, foundations, and religious and other organizations.¹⁰

Not surprisingly, annual gift support has some identifiable relation to the state of the economy. Indeed, it is rather strongly correlated with the New York Stock Exchange Index.¹¹ This level of volatility in giving should be acceptable, and to the extent that gifts are placed in endowment, or at least treated as endowment, such fluctuations are smoothed. As noted in my first Kerr Lecture, however, during the dot-com era fluctuations were so strong that they did have important effects in the operating budgets of most private universities. But, in general, the private support of most schools grows slowly and steadily.

⁹ *Voluntary Support of Education, 2004: National Estimates and Trends for Higher Education* (New York: Council for Aid to Education, 2004).

¹⁰ *Voluntary Support of Education, 1992: National Trends* (Washington, DC: Council for Aid to Education, 1992).

¹¹ *Ibid.* p. 5.

It also is a fact of life that the ability of private universities to maintain their excellence, and of public universities to continue to build their endowments and gift streams, will depend in very large measure on the philanthropic priorities set by the coming generation of the wealthiest Americans. To see why this is so, note that in a typical capital campaign for a large university, approximately 80 percent of the total comes from gifts of \$1 million or more. This signals that the views of the very wealthiest donors and foundations are critically important bellwethers. Their large gifts often have important directional or even transformational significance. There is one trend in this important community of extremely generous donors that I find particularly significant – the changing balance between their giving to K-12 and to higher education.

The new generation of education philanthropists, whose wealth mostly has come from successful entrepreneurship, has turned much of its attention to the daunting problem of improving K-12 education in this nation. For many decades, we in America have lived with the strange situation of having the finest and most accessible system of higher education in the world, while simultaneously our system of public primary and secondary education is failing in many important dimensions. The national ramifications of problems in the K-12 system are accelerating rapidly because many of our young people are not prepared to succeed in the workforce that is demanded by the rapidly globalizing economy and the highly competitive international marketplace.

According to a recent article in the *New York Times*, in 1990, grants to higher education of \$10,000 or more from 1,010 of the larger foundations totaled about \$500 million, while those to K-12 totaled about \$200 million. In 2003, grants to higher education amounted to approximately \$1.12 billion, while the K-12 grants had grown to \$1.23 billion.¹²

As one who believes deeply in the centrality of education at all levels to our national well-being, I do not view this philanthropic trend toward primary and secondary education as negative in any way. But it is a stark reminder that it will be no easy feat to continually increase the dependence of both public and private universities and colleges on charitable giving to provide their margins of excellence, innovation, and access.

In the domain of individual philanthropy, there are many other changes and challenges ahead as well. For example, in today's competitive environment, it is increasingly important to provide fellowships to graduate students. Even in the sciences and engineering, where graduate students generally are supported as research assistants on research grants and contracts, philanthropically supported fellowships are now very important competitive tools, especially for the first year of study. In my experience, this need is generally not well understood by the graduates of our universities who are potential donors, because most of those who now are able to provide such funds graduated in the 1960s and 1970s, when federal research support was quite readily available both through research assistantships and also through massive federal-agency-based fellowships such as those established under the National Defense Education Act (NDEA). This is a prime example of the complexity of matching donor passions and objectives with core institutional needs.

¹² T. Lewin, "Young Students Are New Cause for Big Donors," *The New York Times*, 21 August 2005.

Face it, the grand challenge of university fund raising is just that – matching donor passions and objectives with core institutional needs and faculty aspirations and priorities. The art form of accomplishing this is even more difficult today when donors are increasingly businesslike about their gifts and, quite understandably, are especially sensitive to details of results, metrics, milestones, etc. This is exacerbated by the fact that today universities also bring enormous bureaucratic detail and complexity to major gift negotiations and agreements because we must operate under ever-expanding federal regulations and the requirements of oversight groups like the Financial Accounting Standards Board (FASB). Even regulations and controls imposed by state governments and attorneys general increasingly come into play. In the environment created by the Sarbanes-Oxley Act, which governs corporate accounting and board responsibilities, trustees and regents also have become more concerned about detailed language and controls regarding private gifts.

And the word that strikes the most terror in the hearts of academic fundraisers and administrators is *leverage*. Today's prototypical donor expects that his or her gift, particularly when it is associated with research, should be matched by the institution, by other donors, or by federal research grants. Private foundations that support research recoil at the prospect of paying the full indirect costs associated with that research, so those costs must be paid by the institution from other resources. (It is hard for many to accept that universities have a legal obligation to fund such indirect costs because federal regulations forbid charging any research sponsor a lower indirect cost rate than that charged to government grants and contracts.)

Such issues become particularly complicated when we design large research laboratories, centers, or institutes based on private donations. This requires careful balancing of interests and financial realities of all four parties I mentioned at the beginning of this lecture – students, researchers, donors, and government and industry actors. Because such organizations frequently have some degree of autonomy and desire to be free of what both donors and researchers consider to be university bureaucracy, complicated governance issues arise as well. But we simply have to devote the necessary time, thought, and energy to resolving these complexities because the rewards are great. Done right, such laboratories, centers, or institutes are among the strongest ways modern universities can contribute to the long-term welfare of society. Done wrong, they can fail because they are not well integrated into the deepest intellectual life of the university, are built on unsustainable financial models, or are insufficiently flexible over time.

Other changes also raise questions about the future of private philanthropy to colleges and universities. What will be the effect of changing demographics, especially the large number of graduate students who now come from other countries and other societies? I can think of many remarkably generous gifts to U.S. universities from international alumni who became successful U.S. entrepreneurs, or who returned home but wanted others from their part of the world to gain an American education. But I worry that the post 9/11 diminishing openness and welcoming attitude of our country, perceived or real, may have major ramifications regarding international philanthropy in the years ahead. Hopefully, this will play out in a more positive manner, but that remains to be seen.

More broadly, globalization raises multiple questions about the future of philanthropic support for U.S. universities. Major American donors, companies, and foundations are increasingly turning their attention to health and other issues in the developing world. I

strongly salute this, but it could have ramifications for U.S. academia. International donors who in the past have supported the excellence of U.S. universities may believe it is now time to turn their attention to growing the higher educational capacity within their own countries. I salute this, too, and hope that the emerging *meta university* I discussed in my second lecture will allow us to encourage and enable such capacity building. But again, it could impact future gifts to our institutions.

At the corporate and governmental level, some nations, especially Japan, have passed through various stages in their development of industrial and economic power. In the 1980s and 1990s, many Japanese companies made generous investments in certain U.S. universities. For example, MIT today has around thirty professorships endowed by Japanese companies. These, in my view, were wise investments. They were very helpful to us in building our excellence in a wide variety of fields and also established mutually beneficial personal and professional relationships between some of our best professors and the Japanese companies and leaders. It also provided opportunities for our faculty and students to know and appreciate another country and culture and to form more global perspectives. This helped many of our students become more valuable employees of U.S. companies as globalization proceeded. Frankly, it also provided first-rate academic advice and interactions for Japanese companies during the waning years of an academic culture and, indeed, of legal restrictions in Japan – neither of which encouraged their own universities to work with industry.

Finally, and most obviously, many U.S.-based global companies are now investing substantially in other countries by establishing R&D facilities and also by expanding technological and management education there. It is in these companies' best interests to build technical capacity, human capital, and expanded future consumer bases in countries moving up the economic ladder. Clearly, it also is very cost effective, given the dramatically lower wage scales in many other countries. Again, I strongly believe that expanding education and knowledge-generation worldwide is among the very worthiest of goals, but we cannot be oblivious to its effects here at home.

Student Financial Aid

To complete this discussion of higher education philanthropy, let me comment in some detail about the structure, trends, and issues of student financial aid. Financial aid is arguably the most important and, traditionally, the most popular and prevalent use of private gifts in both state and private universities.

All institutions of higher learning in the United States strive for *excellence* and *access* of students to that excellence. In all but a few of the wealthiest schools, these goals clash when an institution decides the purpose of its financial aid. The amount of financial aid available and the philosophy that governs its use are major determinants of who attends the school, for the simple reason that they are key to establishing the actual price of attendance that must be borne by a student and his or her family.

Financial aid is also an area in which both partnership and conflicts between the federal government and colleges – and between colleges and parents – are common. It is a matter that evokes emotion, politics, conflicting philosophies, and misunderstanding. My purpose for exploring aspects of these issues here is that private giving is key to financial aid in most institutions and it is an area where the sands are shifting rapidly.

Gordon Winston points out with great clarity that colleges are strange businesses.¹³ In traditional businesses, a company produces a product. There is a *cost* incurred to produce the product. The product is offered to potential customers for a *price*. If customers are willing to pay a price that exceeds the cost, the company can make a profit and continue in business. If the market can only sustain a price that is less than the cost of producing the product, the company fails and goes out of business.

Colleges and universities, however, provide a service that almost always costs more than many students can or will pay. In business terms they operate at a loss that must be made up by a *subsidy*. In a public university, much of that subsidy is provided by state appropriations. In private institutions, much of the subsidy is provided by funds and endowments largely built from gifts and bequests from alumni and other private donors.

An important component of the subsidy is financial aid, i.e., grants and loans to students and their families. In both public and private colleges and universities, the federal government provides some financial aid to many students. The relative amount and nature of the financial aid provided by the federal government versus that provided by institutions has changed dramatically during the last few decades.

In 1971, about 50 percent of the financial aid provided to post-secondary students was in the form of direct grants, i.e., scholarships from the federal government; about 20 percent were *grants* from the institutions (primarily derived from individual philanthropic giving); and approximately 30 percent were in the form of *loans* from the federal government. Thus 80 percent of the financial aid came from the government, dominantly (58%) in the form of direct grants.

For a brief period in the late 1970s, federal grants soared to account for about 70 percent of the mix, and federal loans comprised about 20 percent. By 1990, federal grants dropped dramatically to only 15 percent of the total financial aid; 25 percent came from grants provided by the institutions; and nearly 60 percent was in the form of federal loans – a mix that has been stable for over a decade. Thus, today, almost 80 percent of the financial aid still comes from the federal government, predominantly in the form of loans. (Only 24 percent of the federal aid to students is in the form of direct grants.) It should be noted, however, that the loan to grant ratio is much higher for the graduate student population than for undergraduates.

In constant dollars, i.e., purchasing power, total federal expenditures on student grants grew by 96 percent between 1971 and 2004, whereas institutional grants grew by 600 percent, and federal loans to students grew by 830 percent. This enormous growth of federal loans relative to federal grants is a major factor in the economics of American higher education.¹⁴

During the last two decades, the purpose of institutional financial aid, which, as we have seen, comprises about half of the total grant (scholarship) funds provided to students,

¹³ See, e.g., G. C. Winston, "Toward a Theory of Tuition: Prices, Peer Wages, and Competition in Higher Education," Paper DP-65, Williams Project on the Economics of Higher Education, Williamstown, MA, January 2003, <http://www.williams.edu/wpehe/abstracts.html#dp-65>.

¹⁴ College Board, "Trends in Student Aid, 2004," http://www.collegeboard.com/prod_downloads/press/cost04/TrendsinStudentAid2004.pdf.

has been vigorously debated in the academic community. Basically, grants are either given as need-based aid or as merit-based aid, and this is at the core of the clash of values of excellence and access.

Need-based financial aid is distributed to students in proportion to a measure of the student's and his or her family's ability to pay the tuition, fees, and room and board necessary to attend a college to which he or she has been admitted. An institution that is fully committed to need-based financial aid considers that all of the students it admits are academically meritorious, and our covenant with them is that if they are admitted, we will make sure that they can attend, regardless of their financial capability. Need is assessed on a case-by-case basis by using standard federal forms, sometimes supplemented by additional information, to determine the amount a family is reasonably able to pay for the student's education. The difference between that amount and the sum of tuition, room and board, and other expenses is provided to the student as some combination of institutional and federal grants and loans. Some obligation to work to earn a fraction of the cost is also included. Thus, in an institution dedicated to need-based aid, a student from a poor family will pay very little, while a student from a very wealthy family will pay most or all of the cost of attendance.

Merit-based financial aid is distributed to students in recognition of high academic merit, i.e., demonstrated intellectual excellence, or, in some cases, artistic or athletic excellence. The amount of institutional grant to a student in this case is independent of the student's or family's wealth. Thus it is equally likely, or arguably more likely, to go to a student who could reasonably afford to pay a substantial portion of the cost of attendance.

An institution that awards most or all of its financial aid on the basis of merit generally sees it as a means to compete against other schools for excellent students who will increase the academic quality of the institution. Many such universities administer financial aid through the practice of *enrollment management*; that is, they deploy these and other resources in a way designed to maximize the quality of their student body. A school that awards grants predominantly or entirely on the basis of need generally views financial aid as a charitable resource to provide talented students with access to an expensive education that they otherwise could not afford. It is in this sense that the values of excellence and access come into conflict.

A court case involving MIT has particular relevance to this conflict and to the current state of need-based financial aid, especially in private institutions. Let me digress briefly to review it.

The Overlap Law Suit

In May 1991, U.S. Attorney General Richard Thornburgh brought a formal complaint against the eight Ivy League universities and MIT, charging that they illegally colluded in the Overlap Group, a set of colleges and universities that held meetings to assure that financial aid to students applying to more than one of these institutions was awarded only on the basis of financial need. The next week he left the administration to run for the U.S. Senate. This was a bizarre application of the Sherman Anti-Trust Act; indeed it was the first time that a nonprofit organization had been sued under this act. That fact

undoubtedly brought a lot of zealotry to Justice Department attorneys who sensed a new legal frontier to pursue.

The other eight institutions signed a consent decree, essentially a way of saying that they had done nothing wrong, but would not do it again.

The Justice Department claimed that the institutions were conspiring to set financial aid levels in a non-competitive way, but what really was at stake was the future of the view that the role of financial aid is to enable those who would not otherwise be able to attend a fine university to do so. MIT decided to challenge the Justice Department in court.

MIT had long believed, and believes today, that undergraduate financial aid exists to enable bright students who come from families of modest means to attend college. We admit students on the basis of their merit and we distribute financial aid on the basis of their need. For many years prior to 1991, the eight Ivy League schools, MIT, and about forty other institutions had been mutually committed to these principles. Every year we compared data on the financial need of those students who had been admitted to more than one of our institutions. Using a common methodology, we compared the judgments of our financial aid officers on each of these families' ability to pay a share of the cost of their child's education. We made no common decisions about what tuition to charge or how much aid to provide, but we did make a common assessment of their need.

What then happened?

There was a protracted and dramatic legal battle. Economic experts argued, newspapers editorialized in our favor, and eloquent witnesses testified about the virtues of MIT's system of merit-based admission and need-based financial aid. We predicted that if we did not prevail, the nation's financial aid system would spin apart and more and more financial aid would become merit-based, i.e., given to very good students who did not actually need it in order to recruit them to campuses.

MIT lost the case in the U.S. Circuit Court in Philadelphia. Within hours, to the utter astonishment of the Justice Department, I held a press conference and announced that we would appeal the ruling. The three-judge appellate court heard our arguments, and ruled on September 17, 1993. There were three legal points in question. The court ruled unanimously in favor of MIT on two points and split two to one in MIT's favor on the third point. It remanded the case back to the lower court. For all intents and purposes, we had won a strong victory. On this basis, we negotiated a settlement with the Justice Department that defined terms under which limited agreements and after-the-fact data comparisons could be effected by colleges. These ground rules were further expanded and refined in subsequent reauthorizations of the federal Higher Education Act.

The appeal hearing, normally a very brief and dry affair, had some real drama. We were pleased to accept the enthusiastic offer of the distinguished jurist Leon Higgenbotham to present supporting *amicus* briefs to the court. He had served as chief justice of that very court until only a few weeks before the hearing. He later stated publicly that in his career the two legal endeavors he was most proud of were representing Nelson Mandela and testifying on behalf of MIT. Why? Because he deeply believed that the decades of commitment by the Overlap schools to merit-based admission and need-based financial aid had been a fair and powerful tool in advancing talented underrepresented minorities in American society.

Nonetheless, the Ivies remained under the consent decree for a decade, and the use of merit aid grew across the country.

Many colleges and universities now bargain with parents, matching offers of other schools and trying to maximize the number of top students they can attract with a given financial aid budget. This is known as *enrollment management*. An entire cottage industry of advisors has grown up to assist families in the wheeling and dealing. Clearly in private higher education, institutional aid resources are increasingly consumed in bidding wars for affluent students, absorbing revenues that could be used instead to offer better aid packages to high-need students and/or to offer admission and aid to larger numbers of high-need students.¹⁵

In 2001, a group of twenty-eight leading universities and colleges – including Cornell, Stanford, Yale, and MIT – signed a public document committing themselves to merit-based admission and to a common methodology for measuring need.¹⁶ This was an attempt to nudge the system back in the general direction of its pre-1991 configuration. It is helpful, but the merit-aid approach is strong in many other universities.

Despite this imperfect ending, I still believe that this was a legal battle worth fighting, and we resisted unwarranted government intrusion into the business of private universities. To be sure, this was victory in one battle, not the war. We must continue to be on guard against the perennial attempts to increase federal control of academic affairs.

At the current time, discussions about cost, price, subsidy, and the roles of both governments and institutions in the economics of higher education are more frequently conducted in the context of cost, benefit, and competition, viewing the individual student as a price-conscious consumer/customer. This is understandable, especially given the all-too-real middle-class squeeze. But I believe that there are larger issues of policy and the social contract among universities, governments, and society, and all three sectors are struggling to achieve the proper balance.

The federal Pell Grant program that is aggressively targeted at helping low-income students dominates federal grant aid to undergraduate students. But today the federal government spends as much on income tax credits and deductions for educational expenses as it does on Pell Grants. This helps to attenuate the middle-class squeeze, but, like some merit aid, tax credits and deductions also subsidize even the wealthiest students.

In many states, there is a sense of having to run harder and harder just to stay in the same place, like the Queen in *Alice in Wonderland*, because tuitions have risen rapidly while state appropriations have stagnated. The rapid tuition increases (in percentage terms) at state universities and colleges are reasonably affordable for more affluent students, but frequently state aid resources have not increased fast enough to prevent these tuition increases from imposing growing burdens on low-income students attending public institutions. This is exacerbated by the fact that many states and state

¹⁵ Michael McPherson, private communication, 1 September 2005.

¹⁶ The 568 Presidents' Group Consensus Methodology Policy Guidelines, 2000, <http://568group.org/docs/cmmanual-non.pdf>.

institutions are devoting an increasing fraction of their grant aid to merit-based scholarships.

From all of this, I conclude that funds and endowments for student grants – particularly scholarships for undergraduates – can only be more important in the future. Having engaged in university fund raising since the 1980s, it is my experience that supporting financial aid is very popular among alumni. Innumerable times, I have heard graduates say, “I could never have attended MIT if it were not for financial aid and I want the next generation of students to have the same opportunity.” This is one of the reasons that I believe so passionately in maximizing commitment to need-based aid. It will be critically important to maintain and enhance the spirit of private generosity toward student support in the changing and increasingly complex context described here.

Conclusion

In public as well as private universities, resources provided by philanthropic individuals and foundations and by corporate research sponsors increasingly support the margin of university excellence, and increase the access of students to that excellence. Public university endowments are growing faster than those of private colleges and universities. Universities and industry should increasingly work together as components of our national innovation system – a system that is challenged by globalization and accelerating rates of technological change.

The congruence of interests, goals, and expectations of philanthropists and corporate sponsors with those of universities must be carefully considered. The values of excellence and access frequently come into conflict as schools decide how to award student financial aid from gifts and endowments on the basis of merit or on the basis of financial need. Despite such interesting and important challenges, the generosity of individuals and foundations and the support of far-sighted corporations and industry consortia are central to maintaining and enhancing America’s outstanding system of higher education.