Creating the Future:
The Promise of Public Research Universities for America

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America's public research universities are the backbone of advanced education and research in the United States today. They conduct most of the nation's academic research (62%) while producing the majority of its scientists, engineers, doctors, teachers, and other learned professionals (70%). They are committed to public engagement in every area where knowledge and expertise can make a difference: basic and applied research, agricultural and industrial extension, economic development, health care, national security, and cultural enrichment (McPherson, 2009).

Ironically, America's great pubic research universities were not created by the states themselves but instead by visionary federal initiatives. During the early days of the Civil War, Congress passed the Morrill Land Grant Act (1862) that provided revenues from the sale of federal lands to forge a partnership between the states and the federal government aimed at creating public universities capable of extending higher education opportunities to the working class while conducting applied research to enable American agriculture and industry to become world leaders.

Some eighty years later, in the closing days of World War II, a seminal report, drafted by wartime research director Vannevar Bush persuaded the nation to invest heavily in campus-based research and graduate education through new federal agencies such as the National Science Foundation (Bush, 1945). Once again, the key theme was sustaining a close partnership between the federal government, the states, universities, and industry for the conduct of research in the national interest. This shaped the evolution of the American research university as we know it today (Cole, 2009).

The public research universities created by these two federal initiatives have become key assets in providing the steady stream of well-educated people, scientific knowledge, and technological innovations central to our robust economy, our vibrant culture, our vital health enterprise, and

our security in a complex, competitive, and challenging world. In fact, it was the public research university, through its land-grant tradition, its strong engagement with society, and its commitment to educational opportunity in the broadest sense, that was instrumental in creating the middle class, transforming American agriculture and industry into the economic engine of the world during the 20th century, and defending democracy during two world wars. Today, public research universities must play a similarly critical role in enabling America to compete in an emerging global economy in which educated citizens, new knowledge, and innovation are key.

Yet today, despite their importance to their states, the nation, and the world, America's public research universities are at great risk. Many states are threatening both the quality and capacity of their public research universities through inadequate funding and intrusive regulation and governance. Rising competition from generously endowed private universities and rapidly evolving international universities threaten their capacity to attract and retain talented students and faculty. While the current budget difficulties faced by the states are painfully apparent, and the highly competitive nature of American higher education is one of its strongest features, it is also important to recognize that public research universities are critical national assets, key to the nation's economic strength, public welfare, and security. It would be a national disaster if the crippling erosion in state support and predatory competition among institutions were to permanently damage the world-class quality of the nation's public research universities.

Today's Challenges Facing Public Research Universities

Challenge 1: Shifting Public Priorities

Today the nation's public research universities face urgent and at times contradictory marching orders. They are challenged by their states to expand participation in higher education significantly and to increase baccalaureate degree production in an effort to enhance workforce quality. At the same time, the nation depends upon them to produce both the world-class research and the college graduates at all levels necessary to sustain an innovation-driven and globally competitive national economy. Aging populations are increasingly dependent upon the clinical services of their medical centers. Local economies depend both on their talented graduates and their

entrepreneurial spinoff of companies to market their research achievements. In an increasingly fragmented and hostile world, the nation continues to depend, for its security, on the science and technology developed on their campuses. Meeting these myriad challenges is increasingly difficult as state support of higher education erodes and political constraints on public institutions multiply.

There is ample evidence from the past three decades of declining support that the states are simply not able–or willing–to provide the resources to sustain growth in public higher education, at least at the rate experienced in the decades following World War II. Despite the growth in enrollments and the demand for university services such as health care and economic development, most states will be hard pressed to sustain even the present capacity and quality of their institutions. In the wake of the recent global financial crisis, many states have already enacted drastic cuts in state appropriations, ranging from 20% to 50% (SHEEO, 2011). In this budget-constrained climate, public support of higher education and research is no longer viewed as an investment in the future but rather as an expenditure competing with the other priorities of aging populations, e.g., health care, retirement security, safety from crime, and tax relief. Instead, state governments are urging their research universities to wean themselves from state appropriations by developing and implementing strategies to survive what could be a generation-long period of state support inadequate to maintain their capacity, quality, and reputation.

Challenge 2: The Changing Relationship between Universities and Government

Ironically, even as state support has declined, the effort to regulate universities and hold them accountable has increased. To some degree, this is evidence of governments attempting to retain control over the sector through regulation even as their financial control has waned. Most state governments and public university governing boards tend to view their primary roles as oversight to ensure public or political accountability rather than as stewardship to protect and enhance their institutions so that they are capable of serving both present and future generations. Furthermore, many public research universities today find themselves constrained by university sys-

tems, characterized both by bureaucracy and system-wide policies for setting tuition levels and faculty compensation that fail to recognize the intensely competitive environment faced by research universities.

Yet something more fundamental is occurring. While it was once the role of governments to provide for the purposes of universities, today it is now the role of universities to provide for the purposes of government. As costs have risen and priorities for tax revenues have shifted to accommodate aging populations, governments have asked more and more stridently, what are universities for? The imperatives of a knowledge-driven global economy have provided a highly utilitarian answer: to provide the educated workforce and innovation necessary for economic competitiveness. Governments, in other words, increasingly regard universities as delivery agencies for public policy goals in areas such as economic development and workforce skills that may be tangential to their primary responsibilities of education and scholarship (Newby, 2011).

While it is certainly true that cost-containment and accountability are important issues, it is also the case that most public universities can rightly argue that the main problems for them today is that they are both seriously underfunded through state appropriations and seriously overregulated by state policies in areas such as employment, financial affairs, tuition control, and open meetings requirements. Little wonder that public university leaders are increasingly reluctant to cede control of their activities to state governments. Some institutions are even bargaining for more autonomy from state control as an alternative to restoration of adequate state support, arguing that if granted more control over their own destiny, they can better protect their capacity to serve the public.

Challenge 3: A Rapidly Changing Competitive Environment

The highly competitive nature of higher education in America, where universities compete aggressively for the best faculty members, the best students, resources from public and private sources, athletic supremacy, and reputation, has created an environment that demands achievement. However, while competition within the higher education marketplace can drive quality, if not always efficiency, it has an important downside. When serious imbalances arise in available funding, policy restrictions, and political constraints,

such competition can deteriorate into a damaging relationship that not only erodes institutional quality and capacity, but also more seriously threatens the national interest. It can create an intensely Darwinian winner-take-all ecosystem in which the strongest and wealthiest institutions become predators, raiding the best faculty and students of the less generously supported and more constrained public universities and manipulating federal research and financial policies to sustain a system in which the rich get richer and the poor get devoured (Duderstadt, 2005).

This ruthless and frequently predatory competition poses a particularly serious challenge to the nation's public research universities. These institutions now find themselves caught with declining state support and the predatory wealthy private universities competing for the best students, faculty, and support. Of course, most private universities have also struggled through the recent recession, though for some elite campuses this is the first time in decades they have experienced any bumps in their financial roads. Yet their endowments and private giving will recover rapidly with a recovering economy, and their predatory behavior upon public higher education for top faculty and students will resume once again.

What to Do? Institutional Strategies for the Near Term

Streamlining, Cost-Containment, Productivity Enhancement

Clearly, in the face of the impact of aging populations and the global financial crisis on state and federal budgets and hence on support for higher education, the nation's public research universities must intensify their efforts to increase efficiency and productivity in all of their activities. In particular, they should set bold goals for reducing the costs of their ongoing activities. Many companies have found that cost reductions and productivity enhancement of 25% or greater are possible with modern business practicessuch as lean production and total quality management. While universities have many differences from business corporations–for example, cost reductions do not drop to the bottom line of profits–there is likely a very considerable opportunity for process restructuring in both administrative and academic activities (ITS, 2010).

Of course, in the face of deep cuts in state appropriations, most public research universities have already been engaged in intense cost-cutting ef-

forts, particularly in non-academic areas such as financial management, procurement, energy conservation, competitive bidding of services, and eliminating unnecessary regulation and duplication. They have cut hundreds of millions of dollars of recurring costs from their budgets. But it is now time to consider bolder actions that require restructuring of academic activities as well. Some obvious examples include:

- Moving to year-round operation to maximize use of campus facilities
- Working with peer institutions to develop better metrics and accounting practices to achieve efficiency and productivity
- Making more extensive use of information technology (e.g., online learning, research collaboration among institutions, and sharing of expensive research facilities)
- Exploring model programs to reduce time to degree (e.g., three-year BA/BS and five-year PhD)
- Developing new models for junior faculty development and senior faculty retirement

In fact, it might even be time to take on third rail issues such as faculty tenure by reconsidering the appropriate balance between the role of tenure in protecting academic freedom and providing the security of career-long employment, particularly in professional schools such as medicine and engineering where professional practice is comparable to faculty scholarship in determining both faculty contributions and compensation.

Clearly, current financial models for most American research universities are unsustainable and must be restructured (Zemsky, 2005, 2009). Yet, while efficiency, streamlining, cost reductions, and productivity enhancement are all necessary, eventually stakeholders of American higher education must address the dramatic decline in research university support through investments from all sources–federal government (particularly for graduate education), states, private sector, and students (tuition). As any business executive knows all too well, relying entirely on cost-cutting and productivity enhancement without attention to top line revenue growth eventually leads to Chapter 11!

Privatizing the Public University

Declining state support is driving many public research universities to emulate their private counterparts in the development of an entrepreneurial faculty culture and in the manner in which priorities are set and assets are managed (Ehrenberg, 2006). In such universities, only a small fraction of operating or capital support comes from state appropriation. Like private universities, these institutions depend on tuition, federal grants and contracts, private gifts, and revenue from auxiliary services such as health care for most of their support.

In fact, many states are encouraging their public universities to reduce the burden of higher education on limited state tax revenues by diversifying their funding sources, e.g., by becoming more dependent upon tuition–particularly that paid by out-of-state students–by intensifying efforts to attract gifts and research contracts, and by generating income from intellectual property transferred from campus laboratories into the marketplace. Some states are even encouraging experimentation in creating a more differentiated higher education structure that better aligns the balance between autonomy and accountability with the unique missions of research universities. Examples include Virginia's effort to provide more autonomy in return for accountability for achieving negotiated metrics, Colorado's voucher system, performance funding in South Carolina, and cohort tuition in Illinois (Breneman, 2005).

Yet, such efforts to "privatize" the support of public universities through higher tuition or increasing out-of-state enrollments can also encounter strong public and political opposition, even though there is ample evidence that to date tuition increases at most public institutions have not been sufficient to compensate for the loss in state appropriations (Desrochers, 2011). Furthermore, since state support is key to the important public university mission of providing educational opportunities to students regardless of economic means, shifting to high tuition funding, even accompanied by increased financial aid, usually leads to a sharp decline in the socioeconomic diversity of students (Haycock, 2008, 2010).

The privatizing strategy is flawed for more fundamental reasons. The public character of state research universities runs far deeper than financing and governance and involves characteristics such as their large size, disciplinary breadth, and deep engagement with society through public service.

These universities were created as, and today remain, public institutions with a strong public purpose and character. Hence the issue is not whether the pubic research university can evolve from a "public" to a "private" institution, or even a "privately funded but publicly committed" university. Rather, the issue is a dramatic broadening of the "publics" that these institutions serve, are supported by, and become accountable to, as state support declines to minimal levels.

Extending the Land-Grant Paradigm to a New Century

The success of the land-grant university suggests that this model could serve as the platform for the further evolution of the public research university. For example, both the role of research universities in contributing to the innovation necessary to compete in a knowledge-driven global economy and the changing nature of the research necessary to stimulate breakthrough discoveries and transfer into the marketplace may require new research paradigms. In particular, with the disappearance of many of the nation's leading industrial research laboratories (e.g., Bell Labs), there is a need for new university-based paradigms to conduct translational research, capable of building the knowledge base necessary to link fundamental scientific discoveries with the technological innovation necessary for the development of new products, processes, and services.

To fill this gap, the federal government has recently launched a series of "innovation hubs" involving research universities, national laboratories, and industry designed to link fundamental scientific discoveries with technological innovations (Duderstadt, 2010). However, in reality, this is simply the repurposing of the land-grant agricultural and industrial experiment stations established by the Hatch Act of 1887, a partnership involving higher education, business, and state and federal government that developed and deployed the technologies necessary to build a modern industrial nation for the 20th century while stimulating local economic growth. The highly successful model of land-grant experiment stations and cooperative extension services can clearly be broadened beyond agriculture and industrial development as an expanded mission for land-grant and other public universities to address major national challenges such as building a sustainable energy infrastructure, providing affordable health care for aging populations, and

developing new, globally competitive manufacturing industries. In fact, one might even imagine shifting the 19th and 20th century land-grant priorities from developing the vast natural resources of a young nation to instead focusing on the key resources of the 21st century knowledge economy: the skills, knowledge, innovation, and entrepreneurial spirit of our people. The field stations and cooperative extension programs–perhaps now as much in cyberspace as in a physical location–could be directed to regional learning and innovation needs.

The land-grant model of linking federal and state investment and interest with higher education and business to serve national and regional needs, while initially intended for agriculture and industry, remains a very powerful paradigm for the conduct of both basic and applied research aimed at a very broad range of contemporary needs and priorities.

What to Do? The State Role

Balancing Governance, Autonomy, and Accountability

Many of the most powerful forces driving change in higher education come from the marketplace, driven by new societal needs, the limited availability of resources, rapidly evolving technologies, and the emergence of new competitors such as for-profit ventures. Clearly, in such a rapidly changing environment, agility and adaptability become important attributes of successful institutions.

Unfortunately, the governance of public universities, whether at the level of state government or institutional governing boards, is more inclined to protect the past than prepare for the future. Furthermore, all of higher education faces a certain dilemma related to its being far easier for a university to take on new missions and activities in response to societal demand than to shed missions as they become inappropriate, distracting, or too costly. This is a particularly difficult matter for public universities because of intense public and political pressures that require these institutions to continue to accumulate missions, each with an associated risk, without a corresponding capacity to refine and focus activities to avoid risk. Examples here would include pressures to launch expensive new academic programs in areas such as medicine or engineering without adequate resources or to embark on

high-risk economic development activities through university-business partnerships that may be incompatible with the academic culture. Furthermore there are many demands from state and federal government, governing boards, and public opinion for increasing accessibility, decreasing costs, and accountability for learning outcomes. All of these forces have long constrained the agility of public universities (Miller, 2006).

Little wonder that one finds an increase in the efforts of public research universities to free themselves from the constraints of politically-determined governing boards, the tyranny of university systems, and the intrusive regulation of state government in the hope of achieving the autonomy and agility to adapt to a future with limited state support. Steps should be taken to ensure that during a time of great financial stress on flagship public universities, they are provided with the autonomy and agility to restructure their operations to enable them to survive with their quality intact what is likely to be a generation-long period of inadequate state support. After all, should the states intentionally allow their public research universities to decline significantly in quality and capacity, it would be a major blow to the nation's prosperity and security since public universities are the primary source of advanced degrees and basic research for the United States. Put another way, states should be warned not to add insult to injury by strangling their research universities with unnecessary regulation or intrusion on sensitive political issues such as climate change or gay rights, even as they starve them with inadequate support.

Mission Differentiation and Profiling

It is apparent that the great diversity of higher education needs, both on the part of diverse constituencies (young students, professionals, adult learners) and society more broadly (teaching, research, economic development, cultural richness), demands a diverse higher education ecosystem of institutional types. Key is the importance of mission differentiation, since the availability of limited resources will allow a small fraction of institutions to become globally competitive as comprehensive research institutions (Duderstadt, 2009).

Although most states have flagship state research universities, they also have many other public colleges and universities that aspire to the full ar-

ray of missions characterizing the comprehensive public research university. Community colleges seek to become four-year institutions; undergraduate colleges seek to add graduate degree programs; and comprehensive universities seek to become research universities. Since all colleges and universities generally have regional political representation, if not statewide influence, they can frequently build strong political support for their ambitions to expand missions. Even in those states characterized by "master plans" such as California, there is evidence of politically driven mission creep, leading to unnecessary growth of institutions and wasteful overlap of programs.

A differentiated system of higher education helps to accomplish the twin goals of enhancing educational opportunity and conducting research of world-class quality. But it assigns different roles in such efforts for various institutions. Clearly, limited resources will allow only a small fraction of institutions to become globally competitive as comprehensive research institutions.

So how many world-class research universities can a state–or the nation, for that matter–really afford? This is a highly charged question that usually engenders strong political rhetoric. But perhaps here we can rely upon (or blame) a calculation once made by David Ward, former president of the American Council of Education and chancellor of the University of Wisconsin, Madison. He estimated that supporting a public world-class research university with an annual budget in excess of $1 billion or more requires the tax base of a population of five million or greater. Ward's calculation would suggest that nationwide we could probably afford 60 of these comprehensive flagships. But here it is also very important to add the caveat that many a university that possesses neither the resources nor the scale to become a comprehensive research university has demonstrated the capacity to mount world-class research and graduate programs in more narrowly defined areas. By focusing resources, many regional universities and independent colleges have managed to create peaks of excellence that make significant contributions in particular areas of scholarship.

What to Do? The Federal Role

The Importance of a National Strategy

Nations around the world have recognized the importance of world-class research universities and are rapidly strengthening their institutions to compete for international students and faculty, resources, reputation, and the impact of university-driven research and advanced education on economic prosperity (Weber, 2008, 2010). Yet currently the United States stands apart with no comprehensive policy for enhancing and sustaining its research universities in the face of growing international competition from abroad. In fact, many current federal policies and practices actually harm the competitiveness of American universities, e.g., the failure to cover the full costs of federally-funded research projects (indirect cost recovery, cost sharing requirements), a research appropriations process that favors political influence rather than national priorities, and regulatory constraints that discourage the recruiting of international students and faculty. There is an urgent need to develop a framework of national policies and funding goals capable of sustaining the nation's research universities at world-class levels, embedded in a broader federal R&D policy that addresses national priorities (Augustine, 2005).

Within the broader framework of United States innovation and R&D policies, it is essential that the nation develop specific goals for sustaining the strong academic research, doctoral education, and research universities key to the nation's capacity to compete, prosper, and achieve national goals for health, energy, the environment, and security in the global community of the 21st Century. These goals should include a framework of supportive federal funding and public policies adequate to maintain university research and graduate education at world-class levels (Berdahl, 2010; McPherson, 2010).

Fixing the Flaws

While the federal government continues to be the key sponsor of campus-based research, there is an urgent need for the federal government to end damaging fluctuations in research appropriations and research policy and instead provide steady, sustainable, predictable support for university research over the longer term. This would enable universities to plan their own investments in research facilities and staffing, and it would enable federal research expenditures to become more effective and efficient.

During the past two decades, an era during which external support of campus-based research by federal and industrial sponsors remained at relatively constant levels (at $32 B/y and $2.5 B/y, respectively), there has been a very significant growth in research supported from internal university funds that now amounts to over $10 B/y (Berdahl, 2010). While some of this university-sponsored research has supported scholarship in important areas such as the humanities and social sciences where external sponsorship is limited, much of the growth in university research expenditures has also been driven by the serious underfunding, cost-sharing requirements, and regulatory burden of the research grants and contracts commissioned from universities by government, industry, and foundations. In fact, the present financial burden associated with research grants from federal agencies is estimated by some universities to be as much as 25% of the grant amount. Since the only way for most institutions to subsidize such unsupported costs of federal and industrial research grants is through the reallocation of student tuition revenue or clinical income from patients, universities have been forced into a very awkward and politically volatile position by current federal research policies.

There is an urgent need for federal government to move over the next several years to cover the full cost of the research projects it funds at academic institutions, and it should do so across all federal agencies and universities in a consistent and transparent manner. Private foundations and industrial sponsors should also be advised not to pressure universities to waive or reduce administrative cost rates below actual expenses. In fact, research universities should actively discourage research grants and contracts characterized by inadequate funding or excessive cost-sharing that would require unreasonable subsidies from other university revenue sources such as tuition, clinical income, or donor-specified gifts.

Earlier it was noted that a serious competitive imbalance has arisen in the marketplace for the best faculty, students, and resources, with private research universities now spending almost three times as much to educate each student and 30% more for faculty salaries (McPherson, 2009). This is due, in part, to the degree to which current federal and state policies in areas such as tax benefits, student financial aid, research funding, and regulation tend to preferentially benefit and subsidize the high-cost nature of private institu-

tions. Since one of the great strengths of American higher education is the presence of a balanced system of world-class public and private research universities, it is important that federal and state policies treat both public and private universities in an equitable manner to achieve quality, diversity, and balance in America's higher education system rather than drive damaging predatory behavior.

Restructuring the Support and Conduct of Graduate Education

The erosion of state support of graduate education and research, particularly in areas of science and technology critical to national interests, suggest that the federal government must play a more significant role in graduate student support. In particular, the federal government should become the primary patron of advanced education in areas key to national priorities such as economic prosperity, public health, and national security, just as it accepted this responsibility for the support of campus-based research in the decades following WWII. Federal support of graduate education should be allocated to universities based on a combination of merit and impact. For example, competitive graduate traineeship programs might be used in some disciplines, while grants for other fields might be based on graduation rates or the size of graduate faculties or student enrollments (much like the capitation grants used in the health sciences). Other grants could be designed to stimulate and support newly emerging disciplines in areas of national priority such as nanotechnology or sustainable energy. A key objective would be a better balance in the support among student fellowships, traineeships, and research assistantships.

For their part, research universities should commit to correcting the current flaws in doctoral education and postdoctoral training. Numerous studies confirm a strong consensus that by conducting graduate education in the same institutions where a large portion of the nation's basic research is done, our research universities have created a research and training system that is one of the nation's greatest strengths—and the envy of the rest of the world. Yet it is not surprising that during these times of challenge and change in higher education, the nature and quality of graduate education have also come under scrutiny. The current highly specialized form of graduate education no longer responds to the needs of many students nor of soci-

ety, as evidenced by the difficulty many recent PhDs have in finding employment. Attrition in many graduate programs has risen to intolerable levels, with more than 50% of those who enroll in PhD programs failing to graduate (compared to attrition rates in law and medicine of less than 5%), while time to degree has lengthened beyond five years, only to be followed by required post-doctoral service for many disciplines. These factors have eroded the attractiveness of further graduate study for many talented undergraduates who now prefer to enroll in professional programs such as law, medicine, and business characterized by more predictable duration, completion, and compensation. It is time to launch a serious reform of graduate education in American universities comparable to those occurring in other areas of graduate and professional education (e.g., the Flexner Report in medicine).

Jump-Starting the Rebuilding of the Nation's Research Faculty During a Time

of Financial Stress

There are compelling needs to replenish the faculties of the nation's research universities with new perspectives and capabilities. Yet it is also the case that many institutions are limited in their ability to add young faculty members by serious financial constraints, particularly in public universities now experiencing serious reductions in state appropriations. Furthermore, the recent recession has shaken the confidence of senior faculty enrolled in defined contribution retirement programs, delaying their decision to retire and resulting in a rapidly aging and heavily tenured faculty cadre without the turnover necessary to open up positions for new junior faculty hires. To address this current challenge, likely to last for the next decade, the National Academies has recently proposed a federal program of matching grants to establish endowments for the support of faculty positions, modeled after highly successful programs at the University of California Berkeley and in Canada (Birgeneau, 2009; Canada Research Chairs, 2011).

For the Longer Term: Broadening the Concept of the Public Research University

The American university has changed quite considerably over the past two centuries and continues to evolve today. Colonial colleges have become

private research universities; religious colleges formed during the early 19th century gradually became independent colleges; junior colleges have evolved into community colleges and then into regional universities. Today public research universities continue to evolve to adapt to changes in students (from state to national to global), support (from state to national, public to private), missions (from regional to national to global), and perception (from education as a public good to a private benefit). They are rapidly expanding their public purpose far beyond the borders of their states since the more mobile the society and global the economy, the broader the "publics" served by the university.

This broadening of the public purpose of the public research university is not only mandated by national and global needs for its services, but is also a consequence of the changing motivation of the states to invest in world-class institutions. At a time when the strength, prosperity, and welfare of nations demand a highly educated citizenry and institutions with the ability to discover new knowledge, develop innovative applications of discoveries, and transfer them into the marketplace through entrepreneurial activities, such vital national needs are no longer top state priorities (Courant, 2010). The model of state-based support of graduate education and research made sense when university expertise was closely tied to local natural resource bases such as agriculture, manufacturing, and mining. But today's university expertise has implications far beyond state borders. Highly trained and skilled labor has become more mobile and innovation more globally distributed. Most of the benefits from the graduate training and research conducted at state research universities are public goods that provide only limited returns to the states in which they are located.

Hence it should be no surprise that today many states, caught between the financial pressures of weakened economies and the political pressure of Tea Party activists, have concluded that they cannot, will not, and probably should not invest to sustain world-class quality in graduate education and research, particularly at the expense of other priorities such as broadening access to baccalaureate education or addressing the needs of aging populations. Unfortunately, today not only is state support woefully inadequate to achieve state goals, but state goals no longer accumulate to meet national needs.

While the declining priority that states have given to public higher education may be politically acceptable in the near term, though not certainly for their long-term prosperity, such a strategy could have disastrous consequences for the nation. The scientists and engineers, physicians and teachers, humanists and artists, and designers, innovators, and entrepreneurs produced by public research universities are absolutely vital to national prosperity, security, health, and quality of life in the global, knowledge-driven economy. It is clear that the production of these critical assets can no longer be left dependent on shifting state priorities and declining state support. It is essential to realign responsibilities for support of America's public research universities such that advanced graduate and research programs of major importance to the nation are both supported by and held accountable to the needs of key stakeholders beyond state borders. Here it should be noted that both the unusually broad intellectual needs of the nation and the increasing interdependence of the academic disciplines provide compelling reasons why such federal support should encompass all areas of scholarship including the natural sciences, the social sciences, the humanities, the arts, and professional disciplines such as engineering, education, law, and medicine.

More specifically, one might consider a hybrid structure for the public research university that is better distributed for both support and governance among the states, students, the federal government, industry, and private donors:

- The states, consistent with their current priorities for enhancing workforce quality, would focus their limited resources on providing access to quality education at the associate and baccalaureate levels, augmented by student tuition and private philanthropy.
- Students (and parents) would continue to provide support through tuition and fees, although perhaps increasingly augmented by need-dependent financial aid grants and income-contingent student loans.
- The federal government, in addition to being the leader in supporting university research, would become the primary patron of advanced education at the graduate level (i.e., master's and doctoral degree programs) across all academic disciplines (natural and social sciences, humanities, and the arts) through a coordinated system of fellowships, traineeships, and graduate student assistantships.

- Professional schools enabling high-income careers such as law, business administration, and medicine would become predominantly privately supported through high tuition (enabled by strong financial aid/loan programs) and private giving, similar to private universities.
- Foundations and individual donors would continue to play a major role in the support of both education and scholarship in selected areas while enabling the broader roles of the university such as the preservation of knowledge and culture and serving as an informed critic of society. Yet it should also be acknowledged that while such private support will become increasingly important, for most public institutions it will provide only the margin of excellence on a funding base primarily dependent upon state support and student tuition.

Of course, such an approach would require a new social contract to reflect not only the interests of the states but those of the expanding array of stakeholders providing support for such hybrid institutions. Clearly, not only the governance but the statutory responsibility and authority of these emerging institutions would need to be renegotiated. In view of the likely inability of the states to sustain the essential contributions of their research universities at a world-class level, such an evolutionary path seems not only possible but perhaps inevitable.

The Future of the Public Research University in America

An important theme throughout the history of American higher education has been the evolution of the public university. The nation's vision and commitment to create public universities competitive in quality with the best universities in the world were a reflection of the democratic spirit of a young America. With an expanding population, a prosperous economy, and imperatives such as national security and industrial competitiveness, the public was willing to make massive investments in higher education. While elite private universities were important in setting the standards and character of higher education in America, it was the public university that provided the capacity and diversity to meet our nation's vast needs for post-secondary education and research.

Today, however, in the face of limited resources and the pressing social priorities of aging populations, this expansion of public support of high-

er education has slowed. While the needs of our society for advanced education and research will only intensify as we continue to evolve into a knowledge-driven global society, it is not evident that these needs will be met by further expansion of our existing system of state universities. The terms of the social contract that led to these institutions are changing rapidly. The principle of general tax support for public higher education as a public good and the partnership between the states, the federal government, and the universities for the conduct of basic research and education, established in 1862 by the Morrill Act and reaffirmed a century later by post-WWII research policies, are both at risk.

These forces are already driving major change in the nature of the nation's public research universities. One obvious consequence of declining state support has been the degree to which many leading public universities may increasingly resemble private universities in the way they are financed, managed, and governed, even as they strive to retain their public character. Public universities forced to undergo this privatization transition–or, in more politically acceptable language, "self-sufficiency"–in financing must appeal to a broader array of constituencies at the national—indeed, international—level, while continuing to exhibit a strong mission focused on state needs. In the same way as private universities, they must earn the majority of their support in the competitive marketplace, that is, via tuition, research grants, and private giving, and this will require actions that come into conflict from time to time with state priorities. Hence, the autonomy of the public university will become one of its most critical assets, perhaps even more critical than state support for many institutions.

In view of this natural broadening of the institutional mission, coupled with the increasing inability (or unwillingness) of states to support their public research universities at world-class levels, it is even possible to conclude that the world-class "state" research university may have become an obsolete concept. Instead, many of America's leading public research universities may evolve rapidly into "regional," "national," or even "global" universities with a public purpose to serve far broader constituencies than simply the citizens of a particular state who no longer are able or willing to provide sufficient support to sustain their programs at world-class levels. In fact, one might well argue that states today would be better off if they encouraged

their flagship public research universities to evolve into institutions with far broader missions (and support), capable of accessing global economic and human capital markets to attract the talent and wealth of the world to their regions.

How might institutions embark on this path to serve far broader public constituencies without alienating the people of their states—or risking their present (albeit low) level of state support? One constructive approach would be to attempt to persuade the public—and particularly the media—that public research universities are vital to states in a far more multidimensional way than simply education alone—through health care, economic development, pride (intercollegiate athletics), the production of professionals (doctors, lawyers, engineers, and teachers), and so forth. The challenge is to shift the public perception of public research universities from that of a consumer to that of a producer of state resources. One might argue that for a relatively modest contribution toward their educational costs, the people of their states receive access to the vast resources, and benefit from the profound impact, of some of the world's great universities. It seems clear that we need a new dialogue concerning the future of public higher education in America, one that balances both its democratic purpose with economic and social imperatives.

Today we face the challenges of a hypercompetitive global, knowledge-driven society in which other nations have recognized the positive impact that building world-class public universities can have. America already has them. They are one of our nation's greatest assets. Preserving their quality and capacity will require not only sustained investments but also significant paradigm shifts in university structure, management, and governance. It also will likely demand that public research universities broaden their public purpose and stakeholders far beyond state boundaries. Preserving the quality and capacity of the extraordinary resource represented by our public research universities must remain a national priority, even if the support required to sustain these institutions at world-class levels is no longer viewed as a priority by our states.

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