

## THE ORGANIZATION OF RESEARCH UNIVERSITIES

AT A TIME WHEN THE MOST IMPORTANT inputs for advanced economies are knowledge and creativity,<sup>1</sup> we entrust universities with some of the most pressing missions that a society concerned with its future can have. But universities are constantly under attack for being out of touch with “real world” concerns.<sup>2</sup> In some ways, they are. Many of their programs and at least some parts of their missions have very little to do with the immediate, practical concerns of the day. These are deeply conservative organizations that bear the obvious hallmark of their medieval origins and their many purposes. But they are also prolific sources of new discoveries that remain dedicated to the transmission of knowledge through education and its application through public service.<sup>3</sup>

Understanding why universities are important and why we are making it much harder for them to fulfill their promise requires that we grapple with three things that make these institutions difficult to explain, evaluate, and manage. First, they are defined by a fundamental tension between stable, conservative organizational arrangements and dynamic, risky work. Universities are both exceptionally difficult to change and the source of an amazing flow of ideas, technologies, and discoveries. As we will see, the features that make them slow-moving are essential to their ability to be effective sources of new knowledge.

Second, their work encompasses complex competing missions that can create important synergies. Their commitment to the work of discovery, learning, and application can often seem at odds. But all of these goals help them draw together the interests and needs of many different precincts of society. The benefits of their multiple, competing commitments are put at risk by calls to reduce their complexity by unbundling and streamlining individual activities.<sup>4</sup>

Finally, they are dedicated to maintaining comprehensive research and teaching portfolios. Supporting work that spans the whole range of human knowledge without privileging particular fields or approaches is an incredibly taxing remit. But that very portfolio creates the conditions for ongoing innovation. It also ensures that ideas and people from many walks of life flow to and from campus. Here too, calls to identify and reduce funding for fields that lack immediate and obvious economic prospects run counter to the generative possibilities inherent in maintaining deep, wide reservoirs of knowledge.<sup>5</sup>

The challenge that universities face now is a result of pressure to streamline their work and their organization in order to increase the efficiency of some parts of their missions at the expense of others. However, much of their social and economic value results precisely from their pluralism, commitment to both tradition and innovation, and engagement with the broadest range of topics and approaches to knowledge. In a time when narrowly economic, individualistic, and short-term assessments of value dominate public and political discourse, universities are both challenged and challenging. The very things that make them valuable sources, anchors, and hubs are among the hardest to explain and maintain.

### Distinctive Organizations

In 1963, Clark Kerr—then the president of the University of California—predicted that the United States would soon be home to a distinctive type of university, “an institution not looking to other models, but serving, itself, as a model . . . for other parts of the globe.” The “invisible product” of that institution is knowledge, “the most powerful single element in our culture . . . affecting the rise and fall of professions . . . of social classes . . . of regions and even of nations.”<sup>6</sup>

Today, American research universities set the global standard and continue to attract students, researchers, and faculty from around the world.<sup>7</sup> Universities have become more central than even Kerr envisioned, adding new activities and expanding old endeavors as economic and political tides have turned. As a recent National Academy of Sciences report notes, “While Bell Labs and their counterparts have given way to Silicon Valley and their counterparts, American universities continue to

provide the heartbeat that keeps major innovation alive.”<sup>8</sup> Unlike either the nearly mythic corporate labs or the churning network of rivals in Silicon Valley, major research universities are relatively stable features of our world. They are conglomerate organizations that jointly produce knowledge and the skilled people whose ability to apply it improves our society as a whole.

Many types of organizations, including technology firms, entrepreneurial incubators, and national laboratories, seek to discover or apply knowledge. Others, including two- and four-year colleges and less research-intensive universities, emphasize teaching and the transmission of knowledge and skills. **Only research universities do both things at a very high level across nearly every field of knowledge with a mandate to apply what they produce for the good of all.**

After seeing research universities in this light, you might quickly look about for other institutions that serve as sources, anchors, and hubs. But even the federal government, national and corporate laboratories, industries such as software and biotechnology, and locales like Silicon Valley fall short on serving as all three. The federal government is stable, certainly, but it does not teach and is not dedicated to openness. Silicon Valley (and to a large extent high-tech industry) is also grounded in place and characterized by significant movement of individuals across organizational boundaries, but firms and clusters tend to focus on a small group of topics and to be driven by proprietary concerns.<sup>9</sup> Google’s famous “moonshot laboratory” may approximate what I am describing, but its “extremely secretive” work makes it less of a source.<sup>10</sup>

The great corporate labs of the postwar era came very close to the model I am describing, though without an explicit education mission and across a narrower range of fields than a comprehensive research university. Even so, they have been gone from the scene for decades. The very fact of their demise raises questions about whether any corporate endeavor has the potential to serve as an anchor or hub in the same fashion as a publicly funded institution. Moreover, the workings of the most famous, AT&T’s Bell Labs, was deeply shaped by its parent company’s monopoly and consequent dependence on the federal government’s willingness to allow it to continue. Indeed, “AT&T maintained its monopoly at the government’s pleasure and with the understanding that its scientific work was in the public interest.”<sup>11</sup> Some of the more “academic” features of these labs depended on a complicated, sometimes fraught relationship with the state.

## The Accidents That Set the Stage

**Today’s research universities were not designed to be sources, anchors, and hubs.** They weren’t really designed at all. The U.S. research university we know today is a beautiful accident. It grew to its current form in fits and starts under political and economic conditions that no longer obtain.<sup>12</sup> If the political will and public resources necessary to create a major university from whole cloth existed today, I doubt the result would be either as muddled or as valuable as what we’ve got. **While far from perfect, research universities are effective.** That efficacy is a legacy of their long and conflicted history.

I cannot do anything like full justice to that history here. Many excellent books and articles trace the growth of U.S. universities from their origins in colonial colleges modeled on Oxford and Cambridge to the first graduate schools based on German research institutions<sup>13</sup> and the singularly American synthesis of practical and liberal arts articulated when Abraham Lincoln signed the Morrill Act of 1862 creating land-grant universities in the midst of the Civil War.<sup>14</sup>

For our purposes, the most important period in that history starts with the end of World War II. The size and scope of higher education exploded in the following decades. The year 1944 saw the passage of the G.I. Bill, and 1945 saw the appearance of Vannevar Bush’s manifesto *Science: The Endless Frontier*, which set forth the basic rationale for today’s system of peer-reviewed federal science funding. Dramatic growth in enrollments, the passage of key laws that drove huge influxes of public support for research and education, and the founding of federal science agencies such as the NSF led to a golden age of academia that roughly tracks with the Cold War.<sup>15</sup>

A brief few decades cemented the distinctive features of the American research university in a more or less stable system. While the structural and organizational features of the system remain in place, the language used to describe and evaluate them has changed dramatically. Both the sources of current

arrangements and the shifting rhetoric of public support are important to our story. **Indeed, while universities rely on substantial public support, a key outcome of this time period is the extent to which it is fragmented and framed in relatively narrow terms.**

Historian of education David Larabee tells a somewhat similar story with a different emphasis.<sup>16</sup> **In his view the early conditions of U.S. higher education gave rise to a loose system of institutions that, lacking the central organizing hand of either the state or the church, was perfectly messy, internally contradictory, deeply competitive, and directly responsive to the desires of its key consumers, students, and benefactors, philanthropically minded alumni.** The weaknesses of this system became substantial strengths when Cold War policy battles resulted in an enormous influx of resources for research and education unaccompanied by clear central authority or a well-defined mission.

As a result, the American system of higher education was driven by a small coterie of high-profile, largely private, research-intensive campuses. Those universities reacted to federal largesse with characteristic entrepreneurialism. The outcomes of postwar policy debates, Cold War exigencies, and these peculiar historical endowments created the conditions that made it possible for the nation's universities to solve a long string of problems for the federal government, for industry, and for a growing number of other constituencies. The research universities that are our focus grew to their current shape through a piecemeal, iterative, and at least locally purposeful process whose contours were set by key policy debates that could have gone otherwise.

The first twenty years of the Cold War were an interesting time in America's political development. The challenges of bilateralism created a vested national interest in the direction and outcomes of both education and research conducted on university campuses. But both the history of higher education and the U.S. Constitution weighed against centralized federal intervention. American higher education began as a patchwork of private and religious institutions augmented by land-grant campuses that were enabled by federal action but oriented to their home states.<sup>17</sup> While some founding documents, such as the 1787 Northwest Ordinance, made explicit reference to education,<sup>18</sup> the U.S. Constitution did not, and the Tenth Amendment reserved for the states powers not explicitly delegated to the federal government.

Both tradition and law thus militated against the very kind of federal interventions that have come to define the contemporary research university. Indeed, skepticism about the ways in which federal funding might lead to national control persisted well beyond the immediate postwar years. Kerr himself expressed concerns about the dangers of federal support: "the better and more individual the university, the greater its chances of succumbing to the federal embrace. Washington did not waste its money on the second rate."<sup>19</sup> Hinted at in this snippet is a very real worry that substantial federal funding would flatten out distinctive features of individual universities. Despite all these concerns, the university became ever more central to the project of U.S. state building even as the federal government had to diffuse its control.<sup>20</sup>

Historian Margaret O'Mara points to this key challenge and an unexpected outcome important to our conversation: "The Cold War required a strong state, but American political traditions demanded a weak one. The solution was to empower universities and scientific industries to become agents and partners with the federal government, a choice that gave these local actors new influence over local economies and politics. It also created fiercely competitive dynamics among these partners, which in turn made institutions and industries more entrepreneurial and creative."<sup>21</sup> In terms of research, the results of Cold War politics regarding funding helped create a system in which rivalries among campuses were intense and relationships between universities, their states, and the federal government were complicated.

Matters were no less intricate in the realm of teaching and learning, where an equally strong Cold War mandate was apparent in fields as diverse as creative writing and the hard sciences.<sup>22</sup> Despite compelling national interests and the determinative effect of federal investments in higher education and research, we find ourselves with an academic system where, to quote historian Christopher Loss, "the role of the federal government has been unclear and uncoordinated."<sup>23</sup>

The tension between conceptualizing research universities in terms of federal support and the general welfare of the nation and imagining them as private or state projects more closely aligned with local interests and needs remains today. Its particular Cold War resolution helped create the conditions that

allowed these institutions to be understood to serve the concrete needs of individual students, of national defense, and of particular industries.

Much has been lost from these early debates: a conception of the knowledge mission and its results as a public good; a sense of the need to unify all aspects of that mission; and a compelling argument for federal and state partnerships to support robust investment. All of these are things it is important for us to reclaim.

This is true despite the fact that today's universities emerged from particular circumstances that lasted a relatively short time, and may now be beyond easy recall. "Conceived of and nurtured into maturity as a private good, the American system of higher education remains a market-based organism. It took the threat of nuclear war to turn it—briefly—into a public good."<sup>24</sup> The Cold War years may have been a historical anomaly, but that is no reason to shy away from efforts to sustain and even expand the benefits that resulted. As market fundamentalism has grown more extreme in all precincts of American society, maintaining some of the key strengths of the academic research enterprise requires a return to some of the justifications and language of that exceptional time.<sup>25</sup>

### "Higher Education for American Democracy"

In 1946 a huge influx of veterans enrolled in colleges and universities under the G.I. Bill, creating a "period of trial" for institutions of higher education. In response, President Harry Truman convened a committee of twenty-eight academic and civic leaders with a mandate to "reexamine our system of higher education in terms of its objectives, methods and facilities and in light of the social role it has to play."<sup>26</sup> A year later, in 1947, the Truman Commission released a six-volume report that represented "the U.S. government's first effort to set national goals for higher education."<sup>27</sup>

While the report did not result directly in legislation, it sparked significant public discussion about the role of the federal government.<sup>28</sup> The commission identified three overarching goals for higher education. The first was "education for a fuller realization of democracy in every phase of living."<sup>29</sup> Full realization of democracy drives the committee's manifest concern with equal access, and with education that emphasizes individual development: "to liberate and perfect the intrinsic powers of every citizen is the central purpose of democracy."<sup>30</sup>

This focus on education for the purpose of supporting a distinctive national culture eventually gave way to languages of individual excellence, identity, and efficiency.<sup>31</sup> Today, these more individualistic and market-based rhetorics fit uncomfortably with organizations that grew to their current shape and status under more collective assumptions. Continued justification for broad public support is difficult when key benefits are conceptualized primarily as private goods.

The commission's focus on democracy as an overriding goal of education also brought with it a set of corollaries for how higher education should be organized and funded. The committee often expressed concern that an overwhelming emphasis on natural science research would limit the ability of education to address fundamental issues for democratic society. As a result, they emphasize the need for both research and teaching in the "social sciences and technology."<sup>32</sup>

This recognition was part and parcel of the commission's claims for the national importance of the graduate schools within major research universities, which the committee believed had three major tasks: "basic research and the training of research personnel," "training "experts for . . . government, industry, commerce, agriculture, and public welfare," and "training teachers for all levels of higher education."<sup>33</sup> The work of the graduate schools along with that of the traditional professional schools thus made the newly emerging research universities a key part of the larger national ecology of higher education envisioned by the committee.

Perhaps recognizing the challenges our federalist system of government posed for a national plan, committee members emphasized the need for a diverse<sup>34</sup> set of institutions in a loosely coordinated confederation that relied on both state and federal support. The commission suggested a now-familiar model of financial aid in which grants and loans to those with financial need follow individual students who choose where to enroll.<sup>35</sup> They also recommended substantial direct investment from the federal government into institutions of higher education. The committee's most controversial recommendation (with two members strongly dissenting) proposed that direct federal support be limited to public universities and colleges.<sup>36</sup>



The sizable funds proposed would be allocated to the states, which would administer them on an “equalization basis” to ensure “an acceptable minimum program in the poorer states.”<sup>37</sup> Those allocations would include significant support for graduate students in the form of multi-year fellowships, general operating support for public universities, and substantial funds for capital investment in facilities that would require two-for-one matching by the states.

The explicit rationale for this proposal placed universities and the products of their broadly conceptualized knowledge mission squarely at the interface between national and state interests. It thus emphasized a language of federal-state partnership that has essentially been lost. “The role of the federal government should be that of a partner with the states in their joint concerns for outcomes of education vital to the national interests and the rights of all American citizens under the Constitution.”

<sup>38</sup> All told, the committee recommended federal investment (above and beyond appropriations for financial aid that would flow directly to students) of \$2.8 billion (in 2016 dollars) for 1948, growing quickly to \$4.8 billion (in 2016 dollars) in 1952.<sup>39</sup>

More simply, the Truman Commission recommended a yearly federal investment in graduate training, operations, and capital projects at public institutions of higher education that was about 28 percent of the total amount the U.S. federal government spent on research and development in 1952.<sup>40</sup> If similar federal investment were made now, it would amount to about \$38 billion, just slightly less than the combined 2016 appropriations for the NSF (\$7.46 billion) and the NIH (\$31.31 billion). Such an investment would also, like the 2009 American Recovery and Reinvestment Act (ARRA), include “maintenance of effort” provisions that make federal support contingent on states maintaining adequate levels of investment.<sup>41</sup>

Today this seems like an impossible direct federal investment in public higher education. And yet the report describes the need for federal funding without direct federal control. That offers one useful template for future investments that resonates with American higher education models that stretch back to at least the Morrill Act of 1862.

Also revolutionary was the proposal to integrate teaching at all levels with graduate and professional training—making both key pieces of a knowledge mission intended to meet both local and national needs. The call for instruction and research at high levels in all fields, including the social and human sciences, was bold too. It highlighted the need for academia to be able to address problems arising in multiple spheres of economy and society. Finally, the committee situated the entire growth of higher education within a mandate to equalize access—a call that sounds all too contemporary.<sup>42</sup>

Even though the report proved influential over time, these particular recommendations did not quickly come to pass. Contemporary commentators and historians of education highlight several reasons why. First, and most tellingly, the policy program this report outlined was “all dressed up with no place to go” as committee members lacked the access to Congress and the political clout necessary to push their agenda forward.<sup>43</sup> Lack of access coupled with split government and conflict between the Truman White House and the original “do nothing” 80th Congress led to gridlock.

Perhaps equally important was vocal public controversy sparked by the commission’s recommendations. In the report’s wake, critics expressed strong concerns about the benefits of dramatically expanding access to education, the “equalization” of funding across all states, the committee’s particular view of both democracy and education, and especially the proposal to limit direct federal investment to publicly controlled organizations.<sup>44</sup> Resistance from representatives of private universities was swift and scathing.

This resistance is important because, as historians Julie Reuben and Linda Perkins argue, it “helped defeat proposals for federal aid to expand public systems of higher education . . . Instead of the program for institutional aid recommended by the committee, most federal monies for higher education . . . were linked to the nation’s military agenda.”<sup>45</sup> Many of the Truman Commission’s recommendations were fulfilled in later legislation including the National Defense Education Act (NDEA) of 1958, which President Dwight Eisenhower signed in response to the Soviet Union’s launch of Sputnik. Where the G.I. Bill made higher education available to a particular class of citizens, veterans, the NDEA expanded federal support to students in fields related to national security. In other words, the commission’s language set the stage for the long and sometimes contested process of development that resulted in the particular system we have today.

Emphasizing defense and military applications further concentrated resources in a small number of (mostly private) institutions and an even smaller number of geographic locations, amplifying competition for position in highly stratified status order that still holds today.<sup>46</sup> Focusing on defense also privileged particular fields within those universities, associating federal support for advanced training, institutional, and research support with only one portion of the university.

In later years, the center of scientific gravity would shift from the physical sciences and engineering to biomedicine,<sup>47</sup> but the committee's vision of support across fields, like its emphasis on geographic equality, fell by the wayside. That loss took with it a holistic conception of the public value of the entire institution that animated the commission's concern with democracy. Research in the social sciences and humanities, as well as in natural science fields more distant from defense, came to be, at least rhetorically, divorced from national priorities. That cleavage set the stage for today's arguments about the need to reduce or eliminate funding for fields without apparent and immediate national security or economic implications.

Thus, the Truman Commission report represented a moment when articulating a collective purpose for higher education and associated national support could have resulted in a very different system. Instead, we ended up with a more decentralized system, focused on a limited number of fields, and a rhetoric that aligned the collective national purpose of universities with defense and national security. Thus, the report's aftermath cemented the status order that had been created by wartime contracts.

Absolutely critical for our purposes is the fact that the status order created through World War II research contracting also relates to a hierarchy of student selectivity.<sup>48</sup> In other words, the university landscape that we confront today—a highly stratified, decentralized, exceptionally competitive system that includes both learning and discovery but lacks a unified federal investment or a well-articulated federal-state partnership—is at least partially a result of failure: the failure of an early effort to articulate a clear, centrally coordinated system of higher education founded on a broad conception of national priorities.

## The National Science Foundation

There's a similar turnkey moment when we look at the history of federal research funding. A multiyear legislative battle led to the 1950 founding of the National Science Foundation (NSF). These conflicts pitted a prominent New Deal senator, Harley Kilgore, against supporters of the vision proposed by Vannevar Bush.<sup>49</sup> Kilgore envisioned a federal science policy centralized in a single government agency directed by a broad set of constituencies with coordinating power to set substantive agendas and integrate them with industry.

Bush advocated for a decentralized system administered by scientists that emphasized fundamental research conducted in universities and had very little coordinating or agenda-setting power. Noting that Bush's report emerged from an ongoing political conflict about whether and how the federal government should support research in peacetime, historian Daniel Kevles sums up the difference quite nicely: "Kilgore wanted a foundation responsive to lay control and prepared to support research for the advancement of the general welfare. Bush and his colleagues wanted an agency run by scientists mainly for the purpose of advancing science."<sup>50</sup>

Battle lines were drawn between Kilgore and Bush in the form of competing 1945 bills to found and fund a National Science Foundation. They agreed on much, most notably the need to maintain the freedom of the "individual working scientist" from "political control."<sup>51</sup> They also differed on several key dimensions. The proposals varied in terms of how the foundation would be governed, whether it would support basic science alone or contribute to the translation and application of discoveries, whether the social sciences should have a role and be eligible for funding, how explicit a mandate should exist for spreading the wealth geographically and across different types of institutions, who should own inventions deriving from federally funded research, and whether the foundation should be charged with developing and pursuing a unified national research policy.

Sociologist Daniel Kleinman's book *Politics on the Endless Frontier* offers a detailed analysis of this debate and its outcome. The short version is Bush won and Kilgore lost. But that was as much a

result of circumstance (Roosevelt's death, the election of a Republican Congress, Truman's veto of an early iteration of the bill, and the administrative decisions of the foundation's first director) as of a clean and clear policy mandate.<sup>52</sup> The time the debate took was equally important.

Kleinman notes that "the five year delay in establishing the National Science Foundation left the United States with a fragmented or pluralist system for federal funding of research and the establishment of research priorities."<sup>53</sup> Instead of the single powerful agency envisioned by Kilgore, many agencies with different missions were founded. We shall see that the resulting decentralization of federal funding came to contribute to the power of today's system. But obscuring a unified national interest also put universities at risk and contributed to the challenges we face today.

Kleinman persuasively argues that Kilgore's vision of national science policy offers a reasonable counterfactual to the system we have now. If just a few things had changed, the nation's entire infrastructure for academic research might have been different—perhaps more unequivocally aligned with the kind of broad national interest articulated in the Truman report.

We cannot know whether a more centralized federal research infrastructure would have been as successful as the system we have now. Perhaps. However, the long history of decentralized American higher education, the hold of markets on the national imagination, and the federalism of our political system suggest that reversing course now will be at best problematic. The dangers are especially great if such a reversal were accompanied by a more limited view, targeted narrowly toward productive efficiency and obvious near-term returns on investment.

In discovery, in education, and, at their intersection, the warrant for public investment in our universities has shifted dramatically even as the system that resulted from early cold war politicking and the competitive ferment that followed has remained. Today's research universities are no less dependent on public support, but the general welfare they serve and the investments they receive are harder to see and more challenging to evaluate because of the conditions of their origins.

## Collective National Purpose

I am not arguing for a return to the Truman years. Nor do I suggest that we should disregard the outcomes of individual students or the needs of national security and the economy. Nevertheless, the language that was used to describe the public value of academia in these early debates is worth resurrecting. Emphasizing joint pursuit of collective and individual outcomes is important. Understanding that such outcomes extend beyond the development of technology, jobs, and economic returns is even more essential.

A better language and logic might build on the current structure of academe by emphasizing not only the human but also the social capital created by universities and federal research funding. Networks, along with the knowledge they develop and sustain, are important not just because they make us more secure and spur economic growth but also because they render an uncertain future more tractable. That is why the system bequeathed to us in all its contingent messiness remains worth maintaining, even expanding. Our ability to do that depends on the uncomfortable bundle of activities, missions, and topics we have inherited.

But confusing organizations that persistently challenge the status quo—as research universities do—are unsettling. They can make easy targets in social and political conflicts over scarce public resources. Consider one high-profile example that exemplifies these distinctions. In early 2015, Wisconsin governor Scott Walker unveiled a budget that cut \$300 million from the University of Wisconsin System. The same budget proposed a dramatic revision to the system's mission statement, which is colloquially known as the "Wisconsin Idea." After forceful protests around the state and the nation, Walker's office backtracked on the proposed revision, though not on the substantial budget cut.

The two alternative mission statements quoted here thus represent a useful thought experiment. Imagine the University of Wisconsin, and particularly its flagship research campus in Madison, which is one of the oldest and largest land-grant universities, under each of these two different missions.<sup>54</sup>

First, the actual mission of the University of Wisconsin System:<sup>55</sup>

The mission of the system is to develop human resources, to discover and disseminate knowledge, to extend knowledge and its application beyond the boundaries of its campuses and to serve and stimulate society by developing in students heightened intellectual, cultural, and human sensitivities, scientific, professional, and technological

expertise, and a sense of purpose. Inherent in this broad mission are methods of instruction, research, extended training and public service designed to educate people and improve the human condition. Basic to every purpose of the system is the search for truth.

Next the proposed, and later retracted revision:

The mission of the system is to develop human resources to meet the state's workforce needs, to discover and disseminate knowledge, and to develop in students heightened intellectual, cultural, and human sensitivities, scientific, professional, and technological expertise, and a sense of purpose.

The second mission has the benefit of brevity. But that comes at the cost of dramatically pruning both the university's reach and its aspirations. I can imagine that the clarity of focus in the shorter mission might seem admirable in that it lends itself to easier evaluation. Is the university working? Under the revised mission the answer is yes if (a) students get jobs in the state and (b) local employers feel they have a sufficient pool of workers to choose from. That clarity, though, comes at the expense of the very features of universities that make them essential and unique.

The proposed revision is destructive for several reasons. It strips out the productive complications created by multiple missions, calculates value largely in individual terms across relatively short time frames, and implicitly limits the range of fields and topics that a university should prioritize. Perhaps most importantly, this vision of the university errs by making the institution's pole star currently known needs rather than a search for truth that might reach beyond today's sureties.

American-style universities don't appear around the globe because they are uniquely able to adapt to local workforce needs. Instead, this type of university is prevalent because, at its core, societies and economies that are based on knowledge are "built around the university, its abstracted and universalized understandings and its all important degree certification."<sup>56</sup> Contra Governor Walker, the value of the university is found not in its ability to respond to immediate needs but in an expectation that joining systematic inquiry and education will result in people and ideas that reach beyond local, sometimes parochial, concerns.

If we view universities in this holistic fashion, we change both the grounds of evaluation and the possible scope of their contributions. They prove essential precisely because they create and sustain networks founded on and responsive to knowledge. The networks are bedrock because the patterns of interaction among people are what make it possible for universities to identify and address problems of scientific or practical concern.

Centralized planning and top-down management work about as well on a university campus as they do in the economy as a whole. Instead individuals and teams pursue their interests through interaction and collaboration. People committed to different missions and approaches to knowledge compete for the resources and attention necessary to support their work. The inevitable miscues that accompany risky work can be absorbed and learned from because they happen within the vessel of a stable, conservative institution that is committed to no particular orthodoxy or status quo. Academic life can require a bit of hustle, but universities themselves are slow-moving.

When budgetary or political pressures narrow the institution's focus to emphasize easily documented returns, campuses will tighten their boundaries in an effort to more fully monitor, control, and profit from the products of their work. When a concern with the immediate and the practical reduces the number and diversity of programs, the university's reach into society will diminish and its capacity to bridge many needs will shrink. As that happens, the rationales for public support become less clear and the dangers of divestment more distant. Market discipline replaces the general welfare, and efficient responses to current needs become the watchword.<sup>57</sup>

The result of both trends will be to narrow the reach and aspirations of the academic mission in a fashion very similar to Governor Walker's proposed revision to Wisconsin's orienting ideals. This is why both the commercialization of academic knowledge and efforts to vocationalize the curriculum can be pernicious. By making it harder for universities to be anchors and by decreasing their ability to be hubs, we limit their potential to be stable and effective sources of knowledge and dramatically decrease their public value. If we take steps that have these consequences in an effort to document the clear, immediate, and direct returns to public investments in universities, we stand to dry the proverbial well in an effort to assure ourselves that it remains full.



## But What About the Students?

This book is largely about the research and advanced training components of the university knowledge mission. The contributions of research are too little understood. But the institutions that are my focus also educate the plurality of our nation's undergraduates. Addressing the totality of higher education as such is beyond the scope of what can be accomplished here. But it is important to say a few words about students for several reasons. Teaching and learning too are essential components of the university knowledge mission. Tuition is the dominant form of revenue on most campuses. Education and the presence of undergraduates also helps explain many of the features of research universities that are our focus.

Viewed in terms of the contribution to general welfare that universities make, undergraduate students are important because they help universities stay stable, open, and connected across society. In other words, teaching undergraduates in a research environment is good for the development of knowledge because students help make our campuses better anchors and better hubs. Undergraduates and alumni create and support many of the traditions associated with higher education. They lead universities to project themselves and their aspirations both backward and forward in time. By doing so, they "institutionalize" higher education in the sense offered by sociologist Philip Selznick: "to institutionalize is to infuse with value beyond the technical requirements of the task at hand."<sup>58</sup> All these features help universities be effective anchors.

Students should be well served because higher education is the established path to social mobility and a remunerative career, because they pay to be on campus, and because they are one of the most essential vectors for the transmission and application of knowledge. Serving students well also benefits universities because it means they will be better positioned as hubs when their graduates prosper in many fields and feel enough affinity for their alma mater to return.

Education in a research environment also has larger benefits for society. We do not often acknowledge it, but the primary means of "technology transfer" from universities to the world is graduation. When undergraduates and alumni move back and forth across the boundaries of campus, they make our universities more of a hub. Accessible, high-quality universities help ensure productivity and equal opportunity in our society.

If talent is distributed evenly across the population, and if developing talent strengthens our society both morally and practically, then ensuring the quality and availability of education is essential. But that syllogism provides no justification for wedding education and discovery. Even in the aggregate, individual returns to education, social mobility, and contributions to the workforce we think we need now are not the right measures to justify and evaluate research universities.<sup>59</sup> Lincoln and the politicians who passed the Morrill Act of 1862, the Truman Commission, the architects of the National Science Foundation, and the authors of the Wisconsin Idea recognized the essential collective benefits of placing education together with the development and application of knowledge.

I know this represents a fundamental challenge to the way we commonly think and talk about higher education today. It may seem heretical (or perhaps just naïve) to suggest that the value individual undergraduates gain from their education is a secondary benefit of the larger public mission of the institution. Most people, even most academics, completely and fundamentally take for granted the idea that the highest purpose of the university is the development and success of each student.

Such strong and unquestioned assumptions exert an inexorable pull on organizations, and they are difficult to challenge.<sup>60</sup> If you close your eyes and think about what a university does, you probably imagine undergraduate teaching, football or basketball, and little else. You might go even further and imagine that when undergraduate instruction is done well, it enables students to secure good jobs in the careers they desire.<sup>61</sup> The way we think and talk about the value of the university is shaped by the nearly unquestioned assumption that the correct measure for evaluating success or failure is the value individual students receive. But certainty about our beliefs doesn't always mean they are right.

We all habitually treat teaching and learning as the primary role of research universities for several reasons. First, and most simply, teaching and learning *are* the primary missions of most of the higher education institutions in our society. More than 95 percent of colleges and universities are primarily dedicated to undergraduate and professional education, but that should not obscure the vital importance of those that are not.

Second, the public interacts with research universities by attending school, paying for school, and maybe celebrating the school that they graduated from. Jonathan Cole, former provost of Columbia University, recalls that even the most sophisticated and engaged alumni he encounters rarely ask what new and important discoveries have emerged from their alma mater.<sup>62</sup> We think that the main thing universities do is undergraduate education because that is the main thing universities do with most of us.

Third, undergraduate tuition was initially and has become an ever more necessary source of revenue for universities. As state investments have declined dramatically, tuition increases have been necessary to keep public research universities afloat. Tuition has always been a core revenue source for private institutions. Those dollars are particularly important because they are one of the sources of revenue that are fungible across missions and activities. Together with the overhead reimbursements that accompany federal research grants, some parts of endowment income, and, for public universities, state appropriations, tuition gives academic leaders the ability to make strategic investments in public goods for the campus and in initiatives to respond to new social demands or opportunities.

The paramount frame that governs most public, political, and academic discussion about the value of the university trades an individual student's or family's tuition payments for the opportunity for a better or more remunerative life. This is one reason why the dominant form of social scientific analysis of higher education today emphasizes status attainment. Beginning in the late 1960s with the publication of a book called *The American Occupational Structure*,<sup>63</sup> sociologists of education began to focus very closely on the role that social background plays in educational attainment and success. That link foregrounds the role education plays in social stratification by considering how students from different social origins have differential access to and outcomes from college.<sup>64</sup> Their laser focus on individuals dominates much of the language of analysis and evaluation for higher education today.<sup>65</sup>

A few studies by sociologists and economists explicitly consider the collective benefits of increasing education. For instance, Enrico Moretti finds that increasing the proportion of college-educated workers raises wages for everyone, including those who have only graduated from high school.<sup>66</sup> He also demonstrates that increasing education decreases crime rates.<sup>67</sup> Nevertheless, most of the literature on higher education and its effects treats universities as "sieves" that sort students into different outcomes.<sup>68</sup>

As sociologist Mike Hout noted in a recent review, the literature strongly suggests that "being educated is not only good in its own right; it also produces good outcomes for individuals, their communities and the nation as a whole."<sup>69</sup> Indeed, one careful study suggests that just one third of the value of a university education accrues to the individual being educated, with the rest appearing indirectly for the larger society.<sup>70</sup> While it is compelling, the research on collective social benefit is small relative to the giant literature that highlights the economic and other benefits of education for individuals.<sup>71</sup>

Nevertheless, current scholarship generally suggests that there is reason to remain bullish on the individual value of higher education *and* that too little has been said about collective returns to the general welfare. Attending to individual student outcomes is good and provides a route to social benefit. But understanding how the educational mission helps to make research universities unique and powerful homes for the cultivation of knowledge, the identification and solution of problems known and unknown is even better.

When the cost of an education is so great that debt precludes opportunity; when institutional indifference or the challenges of student life leave a degree out of reach; when the quality of an education is so poor that the investment is wasted; or when the gates of campus are closed to the talented, we correctly react with outrage and seek alternatives.<sup>72</sup> The persistent rhetoric about the impending student loan bubble, the furor over low-cost alternatives to residential education, the confident predictions that higher education is ripe for "disruption," and hand-wringing about the university's problematic business model all seem warranted in this overly skeptical view.<sup>73</sup> But tuition for individual opportunity is not the only contract.

Such an atomized approach undermines the very things that we should be investing in, the stability of the organization, the diversity of its activities, and the distinctive networks it creates and sustains as it does its work. Developing an alternative means asking how the research university's complicated

features make sense.

## How Are Universities Organized?

We need to step back from thinking about one university mission or another and instead try to imagine research universities as very complex organizations that encompass many missions and benefit from synergies among them. One common organizational response to the challenges of managing diverse activities is decentralization, which allows different parts of an organization relatively high degrees of autonomy.

Decentralization on campus is, at least in part, a function of both academic tradition and of the funding system that grew from the seeds of the Cold War. Those arguments demonstrate that the idea of decentralized and competitive institutions resonated with a characteristically American distrust of centralized planning. But a national, collective impulse is a harder sell today when individual returns and market rationales again predominate. The primary rhetorical challenge stems from the fact that understanding how university organization enables the kinds of collective benefits we have been discussing requires significant attention to and investment in public goods, resources that benefit everyone but that no one individual has an incentive to maintain. Universities both create and rely on such shared resources.

Imagine you are buying a car and have narrowed your choice down to three sport-utility vehicles; a Dodge, a Jeep, and a Chevy. Dodge and Jeep are both Chrysler brands. So when you are choosing your car, Chrysler is competing with itself and with General Motors for your business. Chrysler wants you to buy either the Dodge or the Jeep, but not the Chevy. The brand managers of Dodge and Jeep compete as both want you to buy their car. But their rivalry should not be destructive; both would rather you buy the other Chrysler brand before you settle on a Chevy.

Because Dodge and Jeep are both part of Chrysler, they share important resources in common. For instance, Chrysler Capital will happily make you a loan for either a Dodge or a Jeep, and that loan will likely be cheaper if Chrysler sells lots of cars across all its brands. In other words, both Dodge and Jeep benefit at least a little bit when you purchase the other's car. The brand you choose wins bigger, of course, but both stand to lose if you and others go with a different company entirely.

This mix of internal and external competition is common at universities too. Professors do many different things. As a result, we typically compete in some areas and collaborate in others with colleagues both near and far. On any given campus, common resources developed and maintained by the university make multiple types of work more effective. For instance, I routinely use the university's suite of online collaboration tools for teaching, for research, and for activities that blur the line between the two, as when I communicate with students who receive independent-study credit for participating in my ongoing research projects.

Like the library, these tools are a public good for the university. Everyone on campus can use them. No individual pays directly to do so. My use of them does not make it impossible for anyone else to use them. In the terms economists typically use, public goods are nonrivalrous and nonexcludable. The knowledge that universities produce has long been understood to be a public good in this sense.<sup>74</sup> Unlike, for instance, a pair of shoes, a generative idea is something you and I can both use at the same time, and its value often increases as more people use and improve it. That is why public funding to support research is necessary. No individual or company has a private incentive to create a public good.<sup>75</sup> If we leave the creation and maintenance of collective goods to the market, failures result and no one gets what they need.

By the same token, the public goods that universities maintain internally are necessary to create synergies across its various missions and to keep competition among its parts from becoming zero-sum. But no individual program or unit has a particular incentive to support them if internal competition driven by market responsiveness rather than joint pursuit of a collective mission becomes the standard.<sup>76</sup> Consider that many of the things students need to learn—such as how to reason and make decisions from numeric evidence, or how to write effectively from that reasoning—aren't actually taught in individual departments or by specific faculty. Many of the tools that students need to

pursue the projects professors assign, a single department or college doesn't provide. In other words, the units that make up a university's teaching infrastructure are interdependent, and their benefits can't be pinned down so specifically as to locate them in one place on campus.

Under an increasingly prevalent model for decentralized university financing, called Responsibility Center Management (RCM), intracampus competition for students and research grants is the motor of resource allocation. In broad terms,<sup>77</sup> tuition funds follow students. The portion of grants dedicated to reimbursing the costs of facilities and administration, called overheads or indirects, follows researchers.<sup>78</sup> Units—generally, but not always, colleges such as arts and sciences or engineering—receive tuition and overhead funds based on enrollments in the classes their faculty teach and the research grants their faculty win. Those funds are “taxed” by the university's central administration for the maintenance of shared services such as enterprise-wide IT capacity, libraries, and heat, which is very important in my part of the world.<sup>79</sup>

The deans of the colleges use their “after-tax” revenues to support the work of the departments and programs that report to them. Where tuition revenue is fungible, indirect costs can only be used to address costs directly related to federally funded research. In principle the system works much like our national economy, in which taxes on individuals and businesses support investments in public goods like roads, police, education, and, yes, research. If classes in arts and sciences draw more students and the business school's classes draw fewer students, marginally more money goes to the arts and sciences dean than otherwise would. Thus, when departments that teach more students need something from their colleges, they have better grounds to argue for it. But that competition only works because everyone shares access to common resources and because cross-subsidies enable the university to maintain a broader portfolio than strict adherence to current market needs might otherwise allow.

Unlike Chrysler Capital, which must turn a profit on the loans it makes,<sup>80</sup> the central services provided by a university—for instance, information technology and library systems—are generally cost centers. They are expensive.<sup>81</sup> They contribute to both teaching and research, but they have little capacity to make money. The good they do depends on their being accessible to all students and faculty. When shared infrastructure is directly supported by public investments such as yearly allocations of funds from states to their public universities, the pressure to cover costs with tuition and grants declines, and competition among units can give way to greater synergies.

State investments in public universities have declined dramatically since 2001. National investments are generally pegged to individual students or particular projects. At the same time, a greater percentage of the costs of shared resources for research have been shifted from federal grants to the institution itself, a trend that affects public and private institutions alike. Other potential funders have not rushed to fill the gap. Thus more and more of the burden of covering the costs of on-campus public goods falls on students. Greater reliance on tuition revenue makes it more sensible to frame investments in universities in terms of individual returns on individual investments. But the shell game of pushing the costs of capacity that creates national public goods off onto individual students and families is distasteful and untenable. Laundering the costs of public goods in this fashion is only possible because university organization makes both the benefits of public investments and the detriments of their declines hard to see.

## The Good and the Bad About Decentralization

Decentralized systems make drawing a line directly from, for instance, a state allocation or federal indirect-cost charge to a library's purchase and on to an outcome the public cares about very difficult. Even in the somewhat simpler case of private universities, the traces of common investments are hard to draw. How much of the PageRank invention I described in the last chapter can be attributed to Larry Page's access to the Stanford Libraries? Some, certainly, but determining exactly how much is a quixotic effort.

This is why efforts to evaluate university productivity can be so fraught with challenges. Organizational theorists Michael Cohen and James March help explain why that is the case by demonstrating that decentralization in service to multiple, competing missions makes universities into “organized anarchies” characterized by “problematic goals, unclear technologies and fluid participation.”<sup>82</sup>



More plainly, universities have difficulty clearly describing their aspirations because they have so many of them and because they sometimes conflict. They are unsure about what, precisely, needs to be done to reach those goals because the work they do is uncertain and the materials they work with (people and ideas, mostly) are highly variable. They can't even be certain who will do the work and for how long. These uncertainties necessitate a style of decision making that fits few commonsense ideas about productivity and planning. They fly in the face of market discipline, and they should. Like the research enterprise that they anchor, universities pose substantial challenges for those who seek evidence of clear, direct returns on straightforward investments.

One response to this frustrating portrait is to simplify the view of the university and prioritize some aspects of the work done on campus. Because public investments are generally made in universities or even systems of universities, this tendency is particularly common among the regents, legislators, and governors who allocate state funds to public institutions. Pressures from outside (and sometimes from inside) campus often seek to solve the "problems" that result from all these uncertainties by unbundling the university's parts in search of greater efficiency and certainty. This is a grave mistake.

Instead, we should ask how contemporary universities can conduct themselves to allow sometimes discordant missions to help keep society poised to develop valuable new things and respond to complex and unexpected problems. The answer to that question lies in the organization of academic work, the formal and informal "rules of the game" that shape how that work is done, and the networks that work creates and sustains.

Universities are special places that deserve both the protections and the substantial investments our society makes in them. But they are also messy, complicated places that make clear accounts elusive. That lack of clarity can be a source of creativity,<sup>83</sup> but it is also a challenge in political debates about appropriate public investments in the academic mission. As a result of this ambiguity, pressure to emphasize clear and immediate returns and the greatest productive efficiency possible in each endeavor is becoming the norm. Thus, the emphasis in both public and academic discourse focuses on trade-offs and inefficiencies rather than articulating points of convergence.

This is a shame because seeking simplicity in an effort to enable clear cost-benefit analyses makes universities less likely to effectively fulfill their promise to society. The dissonance created by the intersection of many missions and fields can spark ingenuity because the clamor of multiple, coequal concerns makes it more difficult for a single orthodoxy to prevail.<sup>84</sup> Universities are defined by conflicts large and small, by the daily abrasion of different approaches to knowledge, and by distinct scales for weighing the value of their work.<sup>85</sup>

As Clark Kerr noted, the basis of a university's ability to be "a generating force for new ideas and critical commentary on the status quo" is precisely productive conflict in the interaction of different cultures of knowledge.<sup>86</sup> At their best, research universities transform both public and private investments into networks that draw complex intellectual capabilities together across fields and missions. Sometimes irreconcilable mandates loosen the grip of the status quo and create new possibilities for discovery.

Why are universities consistently able to act as sources of new things? Because their conservative nature makes them stable enough to keep the internal competitions and multiple means of assessing worth from tearing them apart. This creates precisely the kind of environment that is poised to yield new knowledge and solutions to unexpected problems.

Why should they maintain multiple missions, at the cost of confusion and potentially inefficiencies in the pursuit of any single activity? Because their commitment to different needs, constituencies, and purposes makes them more resilient while ensuring that no single definition of worth dominates their work.

Why should they continue to span the fullest possible range of fields of teaching and research? Because their true social value lies in their ability to connect to and absorb information from as much of society as possible and because they are a storehouse for knowledge and skills we do not know we need yet.

The public value of universities stems from the very things that make them hard to explain and justify in terms of clear, short-term private returns. Our universities emerged from the crucible of postwar politics to serve broadly public missions with substantial public investments. In the last thirty

years the rhetoric justifying public investment has shifted back toward individual returns and productive efficiency. Public support is flat or declining. This renders internal competition more destructive and makes institutions more reliant on tuition, at least somewhat justifying a shift toward evaluation in terms of student outcomes.

As literary critic Jeffrey Williams describes the situation, universities are “no longer . . . a prime institution of the welfare state, providing a public service to the citizenry for a minimal fee but [have] become a prime institution of the neoliberal state, a pay-as-you-go consumer enterprise.”<sup>87</sup> The seeds of this shift were present early on, as the process of defining both the education and research missions played out politically in the late 1940s. But while public rhetoric and public support made campus-level investments in common goods tenable, the tensions were productive, not pernicious. As both have changed, we run a grave risk of destroying the very features of the academic research system that have come to create so much benefit. Avoiding that fate starts with thinking and talking about the ways in which our research-intensive universities manage to be consistent sources.