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It's Time for Universities to Redesign Their 75-Year-Old Contract

Seventy-five years ago this summer, President Truman signed the bill creating the National Science Foundation (NSF), setting in motion an innovation ecosystem that has delivered unrivaled military protection, remarkable economic growth, and countless lifesaving advances. The creation of NSF inaugurated the proposition that universities are responsible for producing a "flow of new scientific knowledge to those who can apply it to practical problems in government, in industry, or elsewhere," as Vannevar Bush wrote in *Science, the Endless Frontier*. Over time, research universities came to excel at fulfilling the technical side of this relationship with the federal government. But they have been slower to recognize the other dimension of this relationship, which obligates them to work towards equitable social outcomes benefitting all Americans.

Today, as political rancor, distrust of expertise, and declining trust in institutions threaten to dismantle the longstanding social contract between research universities and the American public—not to mention the funding, grants, and contracts that underwrite technical innovation—it is clear that there were design flaws inherent in Bush's vision. Although research universities have delivered a litany of *technical* triumphs, the *social* outcomes of their discovery, creativity, and innovation have been sometimes inadequate and incomplete. And, ironically, although universities unleashed an age of massive technical innovation, they failed to innovate their own designs to meet the changing needs of society. Now, each American research university must recognize how they are affected by this design flaw to redesign their own operations to meet the tremendous challenges that lie ahead. At Arizona State University, we have been working on correcting this design limitation over the past two decades, and we have seen that it is possible to integrate the social as well as the technical outcomes of the contract by embracing organizational innovation and responsivity.

The technical and social dimensions of the contract

By funding basic research without immediate commercial objectives and incentivizing technology transfer and commercialization efforts, postwar investments by the federal government helped America's research universities become key nodes in the national innovation ecosystem. In turn, the universities produced technical breakthroughs that transformed industries, cured diseases, and increased lifespans through countless discoveries in physics, engineering, chemistry, biology, and medicine. These advances were pivotal to the emerging knowledge economy that powered research on technologies such as

smartphones, the internet, artificial intelligence, and biomedical regimes to treat cancer and heart disease. Collaboration between universities, industry, and government has produced prosperity, wellbeing, and unprecedented economic growth for four generations.

The social dimension of the contract was more qualitative and therefore more difficult and nuanced to assess and address. It included not only conducting research aimed at solving problems, but also encouraging intergenerational social mobility through education, funded in part through the GI Bill and later Pell Grants and student loans. But even as leading research universities produced a plethora of problem-solving technologies, they gained a reputation for being elitist. This was reinforced by the fact that they primarily focused their efforts on students from families in the top half of American incomes, who have consistently gotten 7 out of 10 bachelor's degrees—a ratio that has barely budged in the last 50 years. And, as technology suffused American life, health disparities persisted, income inequality grew, and social mobility lagged. A recent analysis by economists Zachary Bleemer and Sarah Quincy explains that "the relative premium [of going to college] received by lower-income Americans has halved since 1960," suggesting that for the Americans who need it most, the value of college degrees has been declining for 65 years. Moreover, as of fall 2023, 43.1 million Americans had started college but failed to finish—leaving many struggling with debt. It is not surprising that a widely cited 2023 Gallup poll showed that only 36% of Americans expressed a "great deal" or "quite a lot" of confidence in higher education.

It is this failure to recognize and deliver on the social dimensions of the contract that has made universities particularly vulnerable to today's political showdowns. The current crises arise as research universities are vulnerable to a demographic decline in the number of eighteen-year-old applicants, challenges posed by research conducted by foreign adversaries, and the rapidly improving capabilities of artificial intelligence. Coming all at once, these social, political, geopolitical, and technological changes present an existential challenge for research universities, which will require concerted effort to resolve.

Organizational innovation

As universities reassess their sociotechnical contract with the federal government, they have the opportunity or, more precisely, the obligation to redesign how they assess and deliver education, research, and service outcomes to the communities that they serve. Two decades ago, when we started the process of rethinking our mission at Arizona State University, we had to face some uncomfortable truths. As we noted at the time, there was an "imperative for an institutional response to the lagging educational attainment, lackluster economic output, and unprecedented shift in the regional demographic profile from the sole comprehensive research university in a metropolitan region projected to double in population by midcentury." Working across the institution, members of the academic community undertook a comprehensive effort to redesign the university's sociotechnical contract to build an infrastructure that broadens access to education in a research-grade academic milieu that impacts society at the required scale.

During this reconceptualization, ASU transformed its curriculum, organization, and operations to build an institution committed to pursuing socioeconomic inclusiveness, world-class discovery and innovation, and maximization of social impact. The ASU charter, adopted in 2014, is focused on maximizing the public value of the institution: "Arizona State University is a comprehensive public research university, measured not by whom it excludes, but by whom it includes and how they succeed; advancing research and discovery of public value; and assuming fundamental responsibility for the economic, social, cultural, and overall health of the communities it serves." ASU has instituted reforms to its admissions process and implemented educational technologies allowing it to scale. As a consequence, ASU admits all Arizona students deemed capable of success—regardless of their financial means. Accordingly, enrollment growth has been accompanied by increases in other indicators of academic success: 31% of undergraduates come from low-income backgrounds, 42% are first-generation college students, 85% of on-campus freshmen return for their sophomore year, and 67% of those admitted go on to graduate. More than half identify as minorities. During the 2025 spring semester, ASU enrolled over 190,000 students on campus and online, and research expenditures approached $1 billion.

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Building responsivity

As the charter suggests, simply retrofitting curriculums is not enough. Universities must find new ways to be responsive to the communities they serve. About 20 years ago, the Center for the Future of Arizona, a nonpartisan "do tank," began surveying and networking with hundreds of thousands of Arizonans to find out what was important to them. A decade ago, it began the Arizona We Want Project, which provides polling data about public opinion. Arizona is a purple state where partisan politics sometimes boil at a high temperature, but polling shows that we are united on some values: 92% of citizens believe that all public schools should have qualified teachers and that 82% want to increase the number of high school graduates who continue their education. By understanding these preferences and making appropriate adjustments, ASU has been able to respond to the opinions of citizens rather than just politicians.

The challenges ahead for American universities are daunting. And it does not help that today's media environment favors simplistic stories of billionaire tech heroes that underplay how their innovations frequently derive from university-based research, or how their fledging ventures were underwritten by universities or the federal government. The story of the vast, distributed, knowledge infrastructure of university research—a networked system of actors, institutions, and technologies that collectively generate, preserve, and transmit knowledge encoded in norms, capacities, and networks—is much harder to tell.

It is also worth noting that in the theater of public opinion, discussions about indirect cost recovery, federal research funding, and even taxing endowments have portrayed research universities as freeloaders. In fact, universities are the second largest sponsors of campus research after the government. In 2023, of the $108.8 billion spent on research and development at universities, the federal government provided $59.7 billion, or 55%, while universities forked out $27.7 billion, or 25% of the total, through internally financed research, voluntary cost-sharing commitments, and unrecovered indirect costs. After the federal government, universities spend more on research than state, industry, and nonprofit contributions combined.

As universities across the United States reassess their obligations to society and begin the process of organizational recalibration, they could use better data, as well as better outreach to build responsiveness. Collectively, research universities should pursue a multiyear campaign to reignite the historic trust of the public in higher education by launching and maintaining a national survey that widely assesses what the American people, as opposed to politicians, want from this set of institutions. Likewise, universities would be well-advised to work with groups like the Association of American Universities, Association of Public and Land-Grant Universities, and American Council on Education to pursue coordinated campaigns that promote universities as critical institutions that help America compete domestically and globally through education, research, and service outcomes.

In *The Techno-Human Condition*, Braden R. Allenby and Daniel Sarewitz suggest the following caveats that are applicable to the contingent, unpredictable challenges facing research universities: "Forget about 'solutions'; expand option spaces; expand the number of voices; make more frequent but smaller decisions; encourage questioning and continual learning; and dialogue with Earth systems." The problems facing research universities are dilemmas that are difficult but possible to address. By reimagining how they engage with society across many dimensions, the universities of the future can be a source of responsible scientific and technological innovation, inclusive socioeconomic mobility, and service to their communities.

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