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Evolving Roles of Higher Education in the U.S. Economy: Historical Context for Viewing Changes in Federal Policy and College Performance Goals

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This working paper is related to a series on "The Perils of Pay for Performance in Public Service Industries," which covers healthcare, K–12 education, and higher education.

Abstract

This paper provides a historical review of the evolving roles of colleges and universities in the U.S. economy, with a specific focus on how higher education activities and performance objectives have evolved, and constituencies have expanded over time, driven in large part by national-level policies and federal programs. This includes a wide span of support over time for scientific research enabling technology development, as well as workforce training to meet the changing mix of social and economic activity. The historical review is followed by a discussion of eight key themes concerning higher education today that have emerged from that evolution, ranging from the financing of higher education to its roles in employment training and technology development, as well as issues involving faculty selection, student class choices, and schools' accumulations of endowments. It highlights the concept of shifting higher education performance objectives and roles, and their implications for students, faculty, educational institutions, government, and industry.

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Introduction: American Higher Education and the Economy – A Perspective on Changes Over Time

Objective: Interpreting Today's Challenges for Colleges and Universities

Colleges and universities today face a multiplicity of challenges, both in terms of how their performance is measured and rated for prospective customers (students and their families) and how public policy is defined to provide support and funding for their research and education functions. Most fundamentally, the entire purpose of US higher education and its related teaching, research, sports, arts and other activities is a matter that has shifted substantially over time, driven in large part by national-level policies and federal programs. That, in turn, has created an evolving debate concerning expectations for higher education institutions, their relationship to the economy, and the most appropriate forms of public support for them. This paper describes this evolution over time, with an emphasis on shifts in higher education's role in the development of technology and the economy, followed by a discussion of consequences for key issues being faced today, ranging from the financing of higher education to its roles in employment training and technology development, as well as issues concerning faculty roles, class choices, and endowment uses. All of these issues fundamentally relate to the ways that colleges and universities support the economy .

This paper has two uses. First, it can provide a useful perspective and historical context for viewing key issues regarding federal policy and support for higher education today. Second, it provides a background regarding the ways that higher education performance objectives and performance measures have developed to date and need to be further considered going forward. It also provides a broader context for complementing a separate paper that delves explicitly into performance measures and incentives (Incentivizing Higher Education Outcomes – The Next Frontier of Pay-for-Performance).[1]

Perspective: Why Historical Context Matters

College performance today bears almost no resemblance to what it was in 1636, when the British Massachusetts Bay Colony established the very first post-secondary school in the British Colonies -- Harvard College, originally called New College. Over the next 140 years, by 1776, when the Colonies and, by then, eight other colleges broke from England, higher education had barely changed, although schools did represent more religious diversity.

In colonial days the meaning and measurement of a college's "performance" from the standpoints of its students, their parents, other colleges, churches, and other stakeholders, was not controversial; little was expected beyond students' familiarity with ancient languages, backgrounds for church ministerial positions, and for daughters of wealthy male landowners to find a suitable potential husband, since land ownership was generally legally restricted to males. In brief, there was little disagreement over the meaning and content of a college education, let alone the role of what we now take as commonplace -- profit-generating intercollegiate sports, or to demonstrate its lofty ventures by divesting a college's investments away from such controversial activities as gambling, cannabis production, or even the contribution of higher education to students' long term income opportunities.

Apart from training church ministers, a college was not a vehicle for developing labor force skills or advancing economic growth.

[1] Weisbrod, Incentivizing Higher Education Outcomes… (see bibliography for full citation)

This virtual detachment of colleges from labor markets continued until the industrial revolution in the 1800s. By then, nearing four centuries after Harvard's founding, and five centuries after Great Britain's King Henry VIII established Trinity College in Cambridge, England, higher education was being revolutionized by research largely financed with funding from government and private sources. But with technological change the activities of higher education and economic development became more interdependent.

By 2020, when the higher education focus in the U.S. and much of the rest of the world was redirected by the emergence of the COVID-19 Virus, deemed a "pandemic" by the World Health Organization, the pressing public policy debate had been on what types of college education should be available to "all" adults, and how to finance it. Higher education had become only a distant relative of what it was in the aftermath of WWII, and its transformation has since continued. Following the pandemic, issues of higher education availability and affordability have arisen as public policy issues.

There have also been headwinds. One source is financial resistance coming from tuition price inflation, and rising fiscal deficits associated with the Russia-Ukraine war, which depend on the increasing number of students attending college, the level of Federal loan subsidies per student, and its success in enacting a major loan forgiveness program that has re-shaped higher education.

A second source of resistance is the erosion of education quality, for although it is not easy to reach a consensus on the definition and measurements of quality, there is a price.

A third source of resistance to expanding access to higher education is concern about incentivizing colleges to attract more tuition-paying students, to retain them until a certificate or degree program is completed, and then to control deterioration of educational quality, especially in forms that are easily measured, valued, and rewarded.

Much has changed in the higher education realm over time. In particular, becoming a college graduate has become far from rare, having soared seven-fold, from 4.6 percent in 1940 to 37.7 percent in 2022. And the share of the adult population consisting of high school dropouts plummeted from 74.5 percent in 1940 to 8.8 percent in 2022.[2] These trends increase the national importance of higher education today, as well as the stakes associated with continuation of its funding.

To better understand the evolution of higher education in America, we introduce *snapshots of five historical periods in American higher education*, followed by *eight takeaways regarding issues rising from that evolution* and their implications for the future.

SNAPSHOTS OF FIVE HISTORICAL PERIODS IN AMERICAN HIGHER EDUCATION.

Period 1: In the beginning, 1636-1850

From Pre-Colonial Times

From the perspective of today's U.S. economy, higher education began nearly four hundred years ago, and was most noteworthy not for what it was doing but for what it was *not* doing; it was not changing. For over two centuries, starting with the founding of the first colonial college, Harvard, in 1636, and continuing through the American Revolution in 1776 to the early years of industrialization in the first

[2] U.S. Census Bureau, Current Population Survey…

half of the 1800s, the essence of the higher education sector was that of little change, and its size, composition, and role was vastly different from what we recognize today.

A college was a provider of an elitist education of virtually no practical relevance in an overwhelmingly agricultural economy. The concept of education as "investment in human capital" was not even dreamed of. For centuries the central feature of higher education in England, on which college education in the colonies had been modeled, was its overall insignificance in the economy. While some new colleges did emerge, incentives to change their historic roles in course content and teaching methods were extremely weak.

For decades, Harvard was the *only* college in all the American British Colonies, where there were only some 50,000 colonists, and for years to follow, only some dozens of students attended that single school. Student transportation costs were so high, in both financial and time terms, that competition among colleges was of little relevance; each school had essentially a small geographic monopoly, except for their differences in religious foundations. At Yale, in New Haven, Connecticut, more than 75 percent of students in the pre-revolutionary war period were from that state. And for the total of 226 students who enrolled in King's College (later named Columbia University) during all the years between 1754 and 1776 – only 10 per year -- 75 percent resided within 30 miles of the college -- most within walking distance.[3]

Transportation costs restricted student access and mobility, limiting the opportunities and incentives for competition among colleges to generate diverse program outputs. Apart from locations and religious orientations, the colonial colleges differed little, they taught the same subjects in the same ways, though with some differences in "emphasis." [4] The medieval goals, curricula, programs, and educational philosophies persisted -- and there was little or no incentive for any stakeholder to engage in gaming the financial reward system.

By the time of American independence in 1776, 140 years after Harvard's founding, eight new colleges had opened in the colonies. So, the higher education industry was not entirely dormant. Still the new entrants did not reflect significant change. The new colleges were William and Mary (1693), Yale (1701), Pennsylvania (1740), Princeton (1746), Columbia (1754), Brown (1764), Rutgers (1766), and Dartmouth (1769).[5] They differed little, though, from Harvard's program content and its Puritan religious founders. King's College, later renamed Columbia, was associated with the Church of England, but the British Elizabethan traditions were retained in America until well after independence from England, and the pre-industrial economy presented little or no incentive to re-direct higher education.

The constancy of college programs at that time was attributable to the *lack* of incentives for change. College was not seen as a means of enhancing earning power. Its goals were to teach already-wealthy young men to be "gentlemen," to "love God," and to train for the clergy. As historian Roger Geiger put it, "With some exceptions, the motive was not preparation for careers … [but] a liberal education…." for students from wealthy families.[6]

A college education was, in short, a *private consumer good* having little or no effect on its *graduates'* earning power. The financial incentive to pursue a college education was negligible, except

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[3] Geiger, *The History of American Higher Education…* p.44
[4] Kraus, "The Development of a Curriculum…"
[5] Denham, "A Historic Review…"
[6] Geiger, *The History of American Higher Education…* p.79

for young women who, while legally precluded from land ownership under British law, might find that a college degree enhanced her ability to make a marital match with a wealthy man, or a young man to pursue a church ministry.

Advances in science and measurement, however, were gradually finding their ways into higher education through such new technologies as telescopes, microscopes, and barometers. Yale had imported those scientific instruments as early as 1734, ushering-in the work of such scientific thinkers and inventors as Locke, Newton, and Copernicus. A decade later, in 1745, Yale ended the reign of Latin and Greek, substituting math as an admission requirement. [7]

Yet the effects of these advances in higher education and their wider roles in society were immense. "On the eve of the American Revolution, Newtonian empiricism and inductive reasoning were challenging the teachings of the church and deductive reasoning … and more attention was being paid to mathematics and natural science."

The new legacy of colleges was a growing belief that they were "…preparing young men for citizenship in a republic that must prove itself. The Enlightenment and the Industrial Revolution shifted the curriculum from [sic] medieval model to an emphasis on natural law and the realm of science."[8]

Causal connections between higher education and the overall economy were only beginning to run in both directions, reflecting learning and incentives. By 1792, three years after the U.S. Constitution was adopted, the ideas of the Enlightenment and the American Revolution were reshaping the contents of higher education, science, and knowledge generally; changes within the youthful but evolving college sector were expanding opportunities in the still-dominant agricultural economy, but more so in manufacturing.

Practical labor market goals for colleges were replacing their historical emphasis on classical languages, philosophy, and other cultural components. In the 1790s, Columbia had already introduced professorships in new fields -- economics, natural history, and French, and by 1795 the University of North Carolina was planning professorships in other new fields including chemistry, mechanical arts, and modern languages.[9]

These expansions within higher education reflected the effects of scientific and labor market change elsewhere in the economy. Yet explicit rewards to colleges for their measured performance remained weak well into the 1800s, when the Industrial Revolution was redirecting the demand for labor away from unskilled agricultural workers, who were not being trained in colleges, but in new scientific and technical fields where formal training in colleges was escalating.

Until The Industrial Revolution

During the 1800's, expanding job opportunities were largely in manufacturing but also in the "clerical, sales, and services" sector. In 1800, 24 years after American independence and publication of Adam Smith's path-breaking *The Causes and Consequences of the Wealth of Nations*, the United States was still basically agricultural, using few labor-intensive production processes, yet the importance of agricultural labor in the economy would soon plummet.

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[7] Denham, "A Historic Review…"
[8] Denham, "A Historic Review…", p.4
[9] Denham, "A Historic Review…"

Agricultural employment in 1800 was three quarters of the nation's entire labor force, but in the next half century it dropped by a third, to 55.8 percent, to 30.7 percent in 1900, and by the year 2000 it was close to disappearing as an employer, down to only 2.4 percent of a labor force that had more than tripled.[10]

Meanwhile, employment in manufacturing was starting to grow -- from 13.8 percent of the labor force in 1850, the earliest year for which reliable data on manufacturing employment are available, to 20.8 percent fifty years later, and to a peak of 26.4 percent in 1950.[11]

Until well into the 1800s, college curricula in the United States were essentially carryovers from Britain's Cambridge College traditions of what should constitute "good performance." That had been established in the days of King Henry VIII, with notable emphasis *not* on skills rewarded in the labor market, but on inculcating students with cultural values, through tutorial sessions on learning ancient Latin, Greek, and Hebrew languages, and Aristotelian philosophy.

Labor market considerations -- what we now term *investment in human capital* -- earning power -- were essentially irrelevant in an economy that for centuries was based on *un*skilled work in agriculture that required no advanced classroom instruction. Physical capital, scientific knowledge, and skills transferable through colleges were almost irrelevant until the second half of the 19th century – when Period 2 captures two game-changing legislative events in a new society bent on linking higher education to aggregate economic growth.

Period 2: 1860 – 1940, Industrialization

A New Role for the Federal Government: the Land-Grant College Act (1862)

Well before the Civil War, though, major restructuring of job market opportunities was already underway. In 1800, when 74 percent of the U.S. civilian labor-force aged ten-and-over worked in agriculture, the national decennial Census, required by the U.S. Constitution, did not even ask about employment in "manufacturing," or in "clerical, sales, services," or in a "profession." And job opportunities had been relatively easy to plan for, simply because there was so little change. Each generation followed in its parents' shoes, into jobs requiring little if any knowledge or skill that was efficiently transferable through a college mechanism.

By 1861, change was already under way. As job concentration in agriculture gave way to formation of new types of non-agricultural jobs, though, learning in a college setting became more appealing. By the time of the United States' Civil War, industrialization was dramatically re-shaping the historic role of colleges as providers of cultural consumer goods -- at least in the growing economies of the Northern states. Rather than teaching the sons of the aristocracy to be *gentlemen,* the new higher education model was re-orienting incentives to bridge the chasm between higher education and the evolving industrializing world of work in the private market, increasingly outside of agriculture. Students were being trained for a new economy based on science, mechanization, and, more generally, new knowledge and its industrial applications.

Colleges and universities, long regarded as institutions for *teaching* –increasingly became *research* organizations and conveyers of their findings to applications in the private economy. The Federal Land

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[10] U.S. Census Bureau, *Historical Statistics…;* Carter, "Labor Force"…; Lebergott, "Labor Force and Employment…"
[11] Carter, "Labor Force…"

Grant College Act (Morrill Act, 1862) advanced colleges' outreach goals from their origins as teachers of classical languages and literature to children of wealthy landowners, to conduits tasked with unifying teaching with research and applications to commercial enterprises – aided by Federal subsidies and relaxed restrictions on profits generated jointly with university and Federal support. Agricultural Experiment Stations at state universities assisted farmers and food processors to resolve problems of plant and insect diseases affecting agricultural business.

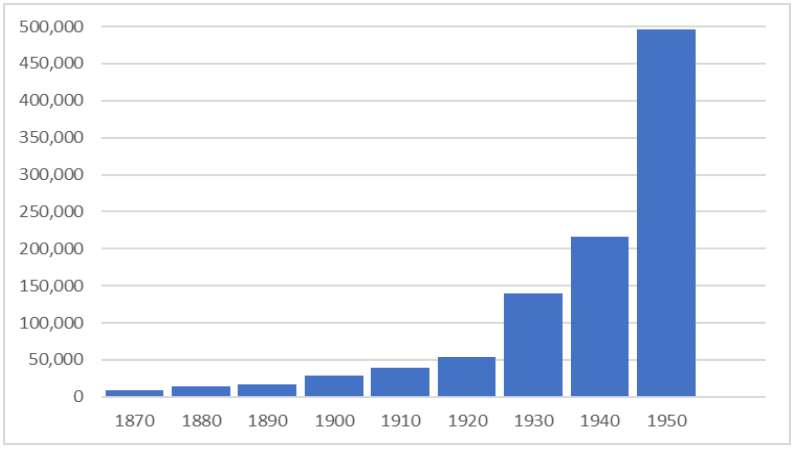
The Land-Grant College Act largely shattered the centuries-old conception of higher education as little more than an expensive toy for a wealthy aristocracy, doing little or nothing to increase its productivity. Under the Act, every state in the nation - current and future - was given 30,000 acres of Federal land to establish a college or university that would integrate practical contemporary studies with traditional liberal education.[12] College training was to be the bridge between the worlds of consumption and investment – a revolutionary goal.

Further Expansion into Research: the Hatch Act (1887)

Fast-forward twenty-five years, to 1887. A second piece of Federal legislation expanded the goals and resources of the Land-Grant College Act. This was the Hatch Act, which introduced a new form of institution -- a national system of *Agricultural Experiment Stations* (AES). It expanded the Country's Land Grant Colleges, which had concentrated on teaching and agricultural-related research, with an added goal -- to disseminate their research findings to practical applications in scientific knowledge, thereby increasing agricultural productivity. The growing body of scientific knowledge of horticulture was to be applied to such problems as prevention of plant diseases and improving irrigation practices. The bridge from college as a purely consumer good, to becoming an investment good wanted for its contribution to a growing economy, was a long time span.

Following the Great Depression of the 1930's and during the ensuing period up to World War II, colleges continued to grow, providing advanced training and research for an increasingly industrial country. But that growth really took off following the end of WW II. (See Figure 1).

Figure 1 total annual college degrees awarded in the US



Source: National Center for Education Statistics (see Bibliography)

[12] National Education Association, "Land Grant Institutions…"

Period 3: 1944 – 1965, The GI Bill of Rights and Expanding College Access

In 1944, near the end of another major war, WWII, the first of a series of G.I. Bills of Rights (officially the *Servicemen's Readjustment Act of 1944*) was signed into law by President Franklin D. Roosevelt. It heavily subsidized college education, as well as health care and housing, for the recent war veterans. Only six years later, during the Korean War, which began in June of 1950 and officially ended in July of 1953, the first G.I. Bill was extended to those more-recent veterans. (Yet another war in Vietnam, from the mid-1950s until April of 1975, led to extension of yet another G.I. Bill, and after the 9/11/2001 attacks and the "War on Terrorism" -- victims of the World Trade Center bombing in New York, and the related plane crashes in Virginia (the Pentagon), rural Pennsylvania, and the various "first responders" -- also became eligible for G.I. Bill benefits.

Following the end of World War II, massive economic restructuring loomed, including the prospect of massive unemployment, geographic migration (e.g., from the agricultural south to the industrial north), and political turmoil. How costly would the processes be? There was an appealing option: expand access to higher education. At the least, millions of workers would withdraw from the labor force," as that was measured, and millions of other veterans who might otherwise be counted as "unemployed," could see the war's end bringing on a serious recession. To the extent that the discharged veterans attended college, though, they would be classified as *students,* who would be excluded from the measured *labor force,* and so not counted as either "unemployed" or "employed." A "winning" strategy was available, though it would be costly.

Thus, the first "G.I. Bill of Rights" was born. It became law in 1944, expanding college access to some 12 million WWII military veterans. But there was a downside – financing it. Costs were especially contentious late in the War and continuing through the 1950s and 1960s.' When Keynesian Economics and its emphasis on government fiscal policy as an economic stabilizer – both an accelerator and a brake -- were taking hold -- the deficit financing was viewed with a mixture of hope and suspicion.

There Were Two Dilemmas for the Federal Government

(1) One dilemma was financial – c*osts of the transition from the wartime to a peacetime economy.* The greater the program's performance *success*, as measured by increased college student enrollments or graduation rates," the greater would be the government budgetary costs. But those greater costs, while politically threatening, could postpone or even prevent a feared depression.

(2) A second dilemma involved *incentives.* The stronger the incentive for military veterans to attend college, as part of the post-WWII transition to a peacetime economy, the greater the adverse side-effects of paying colleges to increase enrollments would be as education costs were measured, even if a college's actions did not actually advance the transition from the wartime full-employment economy to a peacetime economy. The greater the financial incentive is for a college to boost its "enrollment" of military veterans, the more government policymakers could expect schools to increase enrollments, even if not in ways that augment future labor productivity.

There were other such ways for a college to attract more veterans and their government-paid tuition -- by making it easier for a discharged veteran to graduate, perhaps by reducing the number of course credits required for graduation, by permitting or even encouraging, "grade inflation" that would make it easier for a weak or disinterested student to maintain the minimum Grade Point Average of "C" that was typically required to be in "good standing," or by giving college credits for prior "life experience" without the student having to take another traditional course; all of these would speed graduation.

Whether intended or not, the fiscal pressures of a G.I. Bill on government finances were substantially mitigated by the limits on eligibility -- and presumably not accidentally. Government tuition payments to colleges were made available only for veterans of a specific war, and they were available only for a limited period of time; for the first G.I. Bill, education benefits were available only to WWII veterans who had been honorably discharged, and could be used only between 1944 and 1956, when that program was terminated.

Government expenditures on college tuition and other benefits were further limited, not by government but by veterans themselves; over half of the eligible WWII veterans chose not to enroll in any college -- thereby rejecting the subsidies. Despite the tuition-free education opportunity, the full cost of education to a veteran was by no means zero – it included the *opportunity cost* of returning to school, the earnings lost by foregoing a full-time job in order to take advantage of the tuition-free schooling -- was considerably more than tuition, for it included fees, textbooks, and living expenses, as well as foregone earnings. Even with full tuition coverage, these costs could have been a significant influence on reducing the college education benefits "take-up" rate to under half of the eligible veterans. The result was clear; government expenditures were substantially contained by the low take-up rate.

The combination of the near exclusion of women from G.I. Bill education benefits, largely because they had not been subject to a military draft, and the low, under 50 percent, take-up rate by male war veterans, went far to limit the budgetary pressure on Government of this and subsequent G.I. Bills. Were it not for these limits, the G.I. Bills might well have imposed education costs four times or more the actual costs it incurred. If eligibility had been extended, for example, to the entire population of adult women in the same age range as the men who had served, and if nearly all men and women who were eligible for benefits actually accepted them, the total cost to Government would have leaped, and even more so if eligibility for the education and other benefits had not been terminated just 12 years after they began.

Period 4: 1965-2020, Education for All Without Breaking the Bank

A series of post-WWII *G.I. Bill of Rights Acts* also occurred -- associated with ending the Korean War in 1953 and the Vietnam War in 1975. These bills had expanded *access* to college by providing grants for tuition and more, but they had not overlooked costs, by limiting eligibility to *recent* war veterans. The grant processes further limited government expenditure burdens by restricting annual payments for each veteran to four years, and also set a termination date for each G.I. Bill program.

As experience with the series of grant-oriented G.I Bills grew, more of their strengths and weaknesses surfaced. And there were both. The Laws did expand access to college, but essentially only for war veterans, and only temporarily, since the legislation would expire in a decade or so. Even with the limited and temporary eligibility, the fiscal burdens on Congress were restricting college financial access as well as increasing colleges' search for *cost-cutting* educational methods. Creative mechanisms for increasing revenues and decreasing expenditures were also being rewarded.

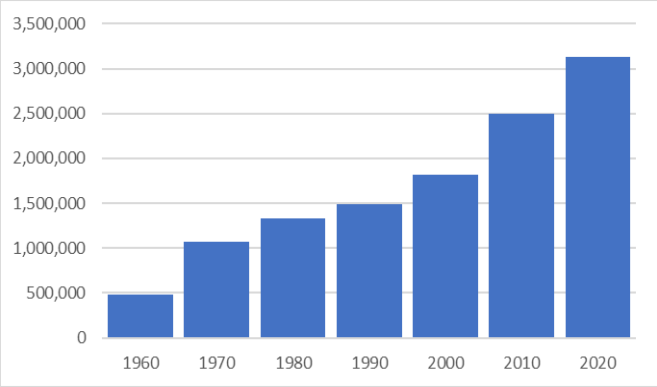
A dilemma remained: can higher education be extended to more people, veterans or not, with little or no tuition costs to students, and at politically acceptable cost to government? If so, how? There were some choices.

- *Loans* to college students were appealing to legislators, simply because they required repayments and so, less budgetary pressure than outright governmental grants;

- *Outright Grants* to students or their colleges, to cover tuition and other costs of attendance, by contrast, are clearly preferable to students and parents; repayment requirements would also be cut sharply, but at greater cost to government.
- Intermediate options, such as *Loan Forgiveness,* are a blending of a grant and a loan. In effect they permit a student who obtained a loan to convert it to a "grant" by re-paying some or all of the loan not in cash but by volunteering for a "public service" such as the Peace Core or an agency providing health care, or one teaching an "underserved" population.
- Another option is offering government grants but only for specific, perhaps low-cost, programs such as tuition-free support at a two-year, "community college," or government adoption of a tax policy that constrained tuition to four-year colleges.

All of these options were discussed, and to varying degrees implemented, as college degrees became increasingly popular. (See Figure 2.)

Figure 2. US Colleges: Annual Degrees Awarded, Selected Years, 1940-2020



Source: National Center for Education Statistics (see Bibliography)

Significant concern about college financing, both by government and by attendees, remained. To be sure, from a government fiscal perspective, loans are *less* costly over time than are grants, insofar as the loans are repaid. From a student perspective, and loans are *more* costly, and for the same reason – the repayment requirement – although a loan "forgiveness" option allows part or even all of a student loan to be converted to a non-repayable government grant in lieu of the cash repayment. This option changes the student's calculus, directing attention to the specific labor supply behavior that qualifies for loan forgiveness, and the rate at which a debt will be extinguished in return for the borrower's later social service provision.

Both Federal and state governments used conditional loan-forgiveness, partial or total, by combining advancement of multiple public policy goals to expand college attendance and graduations, limit costs to government, and reach underserved people and regions. Loan forgiveness became, in effect, a form of barter through which a student-borrower increased supply of certain labor services in exchange for a reduction of loan debt. It came to take many forms, including volunteer work for charitable nonprofits, for additional military service, and for teaching school or practicing medicine in a "needy" area. Also, nonprofits such as AmeriCorps, Peace Corps, and Volunteers in Service to America (VISTA) paid some or all of a student borrower's debt repayment obligations in return for their volunteering time – for example by paying volunteers up to $7400 in stipends, and up to $4725 to cut their student loans.

Some public elementary and secondary schools in low-income areas also contributed to repayments of their teachers' loans; some law schools forgave loans of their students who served in nonprofit or "public interest" positions; the U.S. Department of Health and Human Services offered loan-forgiveness to physicians and registered nurses who practiced for a specified number of years in a remote or economically depressed area, and the U.S. Department of Education had a list of "low-income" schools that offered to pay teachers' loans, while the U.S. Department of Agriculture "offered loan forgiveness of up to $25,000 per year to veterans who committed to work in a veterinary shortage area for three years."[13]

Period 5: Post-Pandemic, 2020's and Into the Future

Notably, discussion in the ramp-up to the 2020 election included increased access to higher education as well as to health care insurance; "higher education for all," and "Medicare for all" -- were in the headlines. But almost overnight those discussions disappeared. The coronavirus-19 pandemic took over, as its effects on "spatial distancing" forced higher education to virtually disappear from the political agenda, replaced by attention to broader issues such as online teaching, larger classes, and part-time faculty; they cut college costs but also cut quality in forms that were difficult to evaluate.

The impact of the coronavirus pandemic on higher education was enormous, not only because of the shift to more remote learning options, but also because the disease made clear the fragility of the higher education system and the lack of clarity of what can realistically be expected of it.

Even before the pandemic, higher education was reaching a historical watershed in public policy – the clash between expansion of access to higher education and efforts to control its costs and quality. Immediately after the pandemic, discussion of higher education expansion was more generally replaced by a smaller discussion of whether there should be forgiveness for loan repayment by low and middle-income families.

Today, the search for ways to reduce the growth of Federal budget deficits has grown, along with efforts for government *cost containment* regarding funding for both research and tuition (student loans). This will likely encourage further efforts to nibble away at educational "quality", with mounting class sizes, and more part-time and temporary faculty to replace more costly, tenure-track faculty. Inflation of college grades will likely continue as tools in colleges' arsenal for boosting student retention, graduation rates, and increasing tuition revenue.

The debate will be increasingly focused on three issues: (1) Will the concept of "higher education for all" still be pursued? And if so, precisely what forms and qualities of higher education should be included, and for how long? For example, up to two years at a "community college," or up to four years at a school offering a baccalaureate degree, or more? (2) How should a school's charges and fees be financed -- particularly, how much by students, how much by loans, and to what extent should loans be subsidized by government grants or loan forgiveness (3) A third issue, although it received little attention in the political debate, is how to deal with the meaning, measurements, and quality of the education, driven by concerns over government deficits and inflation?

The process of opening financial doors to higher education has become the driving force revolutionizing aggregate economic growth and its dispersion within a knowledge-based society. By

[13] FinAid, "Loan Forgiveness…"

examining its historical evolution, we can extract insight into the forces that have brought higher education in the U.S. to its current position and will be shaping of its future.

Takeaways from the Historical Evolution: Eight Fundamental Shifts in the Roles of Colleges

1. Research and Property Rights

No single event would complete the complex of relationships connecting universities, government support for scientific research, and the transmission of successful research for the private enterprise and public sectors of the growing national economy. There were many spans to be designed and executed.

One troubling element of the linking process had been the tension over ownership of *property rights* to inventions growing out of successful research at a university or college, when the research had been financed, even if only partially, by Federal grants. The concept of patent-protection of legal ownership rights of products and methods *developed* at a university but *financed,* even partly, by Federal grants, has been problematic.

True, legal constraints on property rights, including how findings from the research might be used, and how any resulting profits might be allocated among stakeholders, could have large effects on incentives to undertake particular lines of research. The legal structure that defines property-rights can greatly influence incentives for a university to undertake specific research and to pursue market power through patents that permit their owners to license usage to other parties. Government financing of research, together with its regulation of the resulting patent rights, have become important contributors to financing university-based research and its applications in the *Knowledge Economy*.

Federal rules accompanying government research grants to universities and other nonprofits had long prohibited a research institution from patenting a product or device if it had received any government research support. But there was a way to avoid the patent restriction – and legally.

A central element of a university's transition from only teaching to linking teaching to research, and application was, again, incentives. Research came to be increasingly profitable not only by contributing to undergraduate as well as post-graduate education, but by developing a system that rewarded research success sufficiently to make the risks worth taking. The rewards depended on tax and regulatory systems that could permit a university to both receive government research grants and also retain property rights for inventions through the underlying patents and copyrights.

A Brief History of Higher Education Property Rights, Patents, and Incentives

As early as 1641, in the early colonial period when Harvard was the only college in the English Colonies in America, and was only five years old, the importance of tying researchers' incentives to their research performance was already understood; incentives were emerging outside higher education, to encourage research by establishing legal property rights in what came to be regarded as the first American "patent."

The Massachusetts General Court gave the inventor, Samuel Winslow, an exclusive right for 10 years, to utilize his new process for making salt. This Act was case-specific, though, for there was no general law for awarding patents, although it did advance incentives for research by non-government organizations. It took over a century, though, until 1784, for South Carolina to become the first *state* to enact a *general* patent law, granting ownership rights to new inventions for 14 years. Under that law, inventors of machines received the same privileges and restrictions as book authors.

Yet it took another 160 years, largely after WWII, for the Federal Government to enter the research and patenting arena, by granting universities financial incentives to undertake government-supported research. Previously, public policy had sought to assure taxpayers that successful research financed even partially by a government grant would not simply generate profits for the grant recipients but would allow sharing of benefits with consumers and other stakeholders. So, universities that received government research grants were generally *not* permitted to patent discoveries made with those grants. Restriction on patenting (or on copy writing) results of Federal research grants, however, turned out to be easy to circumvent – especially for wealthy universities. They could substitute their own funds, or borrow funds, for those of government, thereby retaining property rights through patents.

Colleges and universities could (1) keep in close contact with their own faculty researchers who were engaged in financially "promising" research, typically in the sciences, and then (2) contract with the researchers to forego using *any* Federal research funding, instead (3) accepting the needed research financing from the university, allowing it to handle the patent application process, and then (4) agreeing that if a patent resulted, the university and the faculty member would share the profit in a pre-determined way.

Yes, the arrangement was cumbersome. It made demands on universities to identify financially promising research at a very early stage, and to have enough liquid assets or access to loans, to substitute them for restrictive Federal grants. But it "worked."

Restrictions on university patenting of products using any Federal grants, though, had been mounting. Some universities were reluctant to borrow, for if the research did not prove to be profitable, they risked reductions in credit ratings. And a negative aggregate effect on university involvement in risky research could not be dismissed.

In 1980, when Harvard was already over 300 years old, the Federal restrictions that had discouraged universities from risk-taking by self-financing its research and then patenting the results, was effectively abolished by enactment of the Federal Bayh-Dole Act -- the University and Small Businesses Patent Procedures Act. [14] Expansion of universities from mechanisms of undergraduate teaching into research centers and doctoral training programs in the sciences was advanced by Bayh-Dole, which reflected the view that teaching and research missions could not only coexist but indeed could strengthen each other. Federally financed laboratory facilities could attract undergraduates considering doctoral programs and careers in research, and provide opportunities for undergraduates to obtain lab experience as research assistants. Those opportunities could attract tuition-paying students, so the undergraduate and graduate programs became complements, each contributing to the other.

The undergraduate teaching market and the scientific research market with its doctoral training programs, were changed by the new incentives in the knowledge economy. After enactment of the Bayh-Dole Act, the Federal Government was free to make research grants to higher education and some other nonprofit organizations without restricting the school's patent rights. The higher education industry took another large step forward on the road from its origin as a luxury consumer-good producer for wealthy consumers, but then develop an additional role as a producer of investment goods largely financed by Federal grants.

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[14] Weisbrod, Ballou, and Asch, *Mission and Money…*

2. Faculty Roles in a Knowledge Economy

For centuries, colleges relied almost exclusively on one type of faculty – employment commitments that are now regarded as *tenured* or *tenure-track positions* – offering students from wealthy, land-owning, families with few if any course and program options. Lifetime job tenure was seen as an inflexible type of employment contract, not easily adaptable to shifting labor demands in an economy, although employment permanence and subject-matter inflexibility were *not* highly problematic in a pre-industrial environment where students seldom switched fields of study.

Times have changed dramatically. In today's economic world of changing employment opportunities, faculty contracts favor greater flexibility in faculty composition, experience, and course offerings. Rather than emphasizing *program* stability, colleges are increasingly shifting their faculty compositions in favor of: (a) less expensive, faculty, and (b) faculty with shorter-term contracts that permit a school to rapidly expand and contract its course offerings in response to changing student interests and job market prospects. And in recent decades, universities have been eagerly responding to offers of increased Federal research support, to unify the interests of diverse private firms, nonprofit foundations, and relaxed Federal government restrictions on intellectual property rights – patents and copyrights -- to universities that had received federal support for the underlying research.

The expansion of various the types of faculty positions is increasingly based not only on the *transmission* of knowledge but on its *creation* through research. The academic labor market has shrunk for faculty pursuing full-time, lifetime, tenured, teaching and research in a well-defined, program area; as those faculty are replaced by part-time faculty who can be replaced on short notice, in response to changes in student interests and availability of research grants in particular fields. Differences in faculty contract durations and salaries, in subjects to be taught, and in external fundraising opportunities that reflect, in large measure, responses to changes in the higher education labor market.

Uncertainties have different effects among stakeholders in the teaching and research markets, in employment security and compensation, and in new program development. Uncertainty about a college's *revenue* -- whether from teaching, research, donations, or other sources -- are also driving forces, as is uncertainty about output production *costs*, which depend heavily on the number of faculty and their wages. In turn, both costs and revenues are tied to college decisions to introduce new "major fields" in which undergraduates can obtain degrees requiring different skills, knowledge, and experience. .

3. New Programs and Expanding Student Choices

The evolution of higher education has added a new characteristic, more student *choices*. Colleges have disappeared as providers of a fixed, unchanging curriculum that offered a student few or no options, as had been the case for some two centuries following Harvard's founding. Colleges became *multi-product* producers, appealing to students with diverse and expanding career goals in the private and government sectors.

Societal concerns and technology changes over the years have also brought changes in college majors and departments. For instance, Northwestern University (Evanston, Illinois) in 2019 introduced a new undergraduate major, *Neuroscience*, hoping to solve disease problems such as Parkinson's and Alzheimer's. Four new courses were added for this *interdisciplinary* major focused on brain-related diseases, and according to the University announcement, more new courses will be introduced. But the new program and major field were just the latest in a total of 15 new major fields introduced since 2000

in the University's Weinberg College of Arts & Sciences; among the 15 were Legal Studies (introduced in 2002), Asian and Middle East Studies (2003), Materials Science (2004), African Studies, Latina and Latino Studies, and Jewish Studies (all 2009), and Asian Studies, Middle East Studies, and Asian Language and Civilization (2010). The expanding geographic and cultural scopes of the new majors are striking, and consistent with universities' competitive search for new revenue from tuition -- particularly from international students and foundations, governments, and wealthy individuals.

However, there are also far more exotic fields of study being created. A hundred years ago, who would have thought that by 2017 a major research university, the University of Virginia, would initiate a tenure-track professorship of *"Hip-Hop"*? [15] Such an expansive domain of college courses was certainly not new. Sixty years earlier, in 1957, Penn State University had introduced a program in *Turfgrass Sciences*;[16] in 1971 Vincennes University established a program in *Bowling Management*, which it dropped in 2015 because of the decline in enrollments,[17] and in 2012 Appalachian State University initiated a major in *Fermentation Science* – beer production.[18] There are numerous other specialized college degree and certificate programs now offered across the U.S., which can be seen as a reflection of changing occupational patterns.

A remaining concern with the effects of introducing new Major Fields of study is that they can come at the expense of cannibalization of previously existing programs. Apart from the consequences for a school's undergraduate teaching mission, new programs can depress enrollments and revenues from dilution of a school's yield from its endowments for existing programs. And with the introduction of new programs there are additional sources of concern: How long will a new program survive? And at what level of student enrollments and external financial support for research?

4. Instruction: Types of Settings, Online Courses, and Measuring "Quality"

One dimension of instructional choice gaining increasing attention is the use of *online* teaching. technology, compared with traditional, face-to-face, classroom instruction. Online instruction has at least two potential advantages – it can be cost-cutting, through the selection of faculty, and by offering students time flexibility to take courses that do not conflict with their traditional classroom attendance.

The downside of online education is largely one of measurement –- of valuing its effects on educational "quality;" the comprehensiveness and biases of performance measures based on "standardized tests" that purport to measure performance of a student or a college, the difficulties of developing tests that cover an ever-widening range of knowledge, and expectations of what a "college education" should and should not encompass – e.g., avoiding dishonesty in test-taking and course paper writing, and substitutions of new instructional techniques that may affect performance quality that is not easily or accurately measured.

Online education is one relatively recent but still expanding college instructional innovation that holds promise of reaching wider audiences and generating more profit, though it also highlights the importance and difficulty of measuring the effects of new technologies on education quality. In recent

[15] Young and Martin. "After Rapping His Dissertation…"
[16] Penn State, Turfgrass Sciences…
[17] Morello, "Vincennes University Axes Bowling…
[18] Appalachian State University 2024.

years, for example, there has been substantial increase in online teaching, spurred by perceived advantages to colleges eager to both cut costs and increase revenue.

In recent years the percentage of college faculty who have taught an online course for credit has increased substantially -- from 30 percent in 2013 to 46 percent in 2019.[19] Whatever the causes of the growth, a result was that the technology of higher education has been changing in ways that encourage cost-cutting and revenue-generation.

"Online education," using modern computer technology, is only some forty years old, released in 1979 for the Apple II computer in the form of an educational game, *Lemonade Stand*. While that technology was relatively new, its origin in *distance learning* was not -- traceable to Great Britain in 1850 and the adoption of *correspondence courses* between students and instructors who exchanged material by mail carried on horseback. *Distance Learning* emerged,[20] but using a technology far slower than today's 2023 version of computerized college education.

In the United States today there is a growing number of "nationally successful online education brands," many are state institutions such as Southern New Hampshire University, Penn State World Campus, Purdue University Global, and the University of Maryland College. The University of Massachusetts System plans to compete with them, reaching out to a largely underserved population of unemployed or unskilled adults in Massachusetts and beyond. [21]

5. Employment Training: Linking Higher Education to Future Job Opportunities

Whatever the choice of instructional methods, online or in-person, whether the methods utilize permanent or temporary faculty, full-time or part-time, and whatever the standards may be for deciding whether a student deserves to graduate, critical obstacles confront higher education and assessment of its performance:

- How well can future job opportunities be forecast for college graduates and dropouts?
- How well can colleges prepare students to anticipate the uncertain changes in employment opportunities over their expanding working lifetimes?

Predicting future job opportunities for a young college student, at around age 20 and with an expected working lifetime of 50 years or more, and then tailoring college programs to such a distant and uncertain future, are becoming increasingly difficult. There are certainly incentives for students, as consumers, and colleges, as producers, to make and use such forecasts, but they do not make the forecasts easy or accurate.

The broader questions: what are the abilities of the various higher education stakeholders – school administrators, faculties, students, employers, and government -- to identify the paths of labor market demand and supply conditions over the 5-6 decades following today's college students' graduation -- to rate, rank, or otherwise measure colleges' ability to forecast lifetime "performance" for each type of stakeholder?

Another fundamental issue is how and by whom should a college's *success* be measured -- by "experts" subjective judgements, by quantitative measures that must be valued or otherwise weighted,

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[19] Inside Higher Education, "2019 Survey…"
[20] Peterson's, "The History of Online Education…"
[21] Lieberman, "Another State Plans…"

in order to be aggregated, or by using *some* algorithm that combines many subjective and objective measures, perhaps in a manner analogous to the *U.S. News & World Report* rankings of colleges, hospitals, and nursing homes?

For colleges, faculty, and students' planning purposes, the central goal was, and is, not to *measure* the *current* quality of a college program by its *past*, but to *predict* its future performance over students' increasing lifetimes. From a human-capital investment perspective, the effectiveness of a school's programs on its students' future earnings remains central, which implies the need to forecast changes in labor market demand and supply, and to develop measures of success that are neither systematically overestimated nor underestimated.

These planning and forecasting problems are not new. But neither are they being solved, and certainly not for young college students trying to plan for their increasing working-life expectancies in a dynamic economic environment. The problem was highlighted by a 1982 study by the U.S. Department of Labor's Bureau of Labor Statistics (BLS) on their ability to predict job-market opportunities in specific occupations. First, they estimated changes in employment for the decade of 1970-80, for each of a number of occupational groups, and it later compared those forecasts with the actual employment at the end of the decade. The differences between the predicted and the actual changes in employment in the specific occupational groups were striking. For "Managers & administrators" the BLS had forecast a small increase of total jobs, from 8.3 million in 1970 to 8.5 million a decade later. But that predicted employment increase of 0.2 million was tiny compared with the actual increase of 2.6 million.[22]

The upshots: the substantial understatements and overstatements of occupational job changes provided scant career guidance for the college students who, in 1970, were at least partially planning their college programs in light of expected job prospects. Moreover, the BLS had not even mentioned, let alone estimated, employment prospects beyond ten years, even though the college students would, rationally, have cared a great deal about them.

A brief background on occupational forecasting for labor market training. The U.S. Department of Labor, Bureau of Labor Statistics (BLS), began forecasting labor market employment opportunities in the 1960s. Its presumed central purpose was to match worker skills with job market opportunities, some of which might develop decades later. But the BLS soon confronted a major hurdle: how to predict labor-market opportunities and worker skills needed decades into the future -- not merely the skills in demand when a young person is planning a college program. Assumptions about "tomorrow's" job opportunities are essential for long-term planning, by colleges, faculty, and governments.

It quickly became evident that forecasting job-specific employment opportunities even one decade ahead, was no small task. The problem was not that employer demand -- willingness to pay -- for workers with particular skill sets were changing – they surely were and still are -- but that new types of jobs were being established and existing types were sometimes being discontinued, often replaced by jobs with "similar" titles but different skill requirements. Thus, in an increasingly knowledge-based, economy, higher education is not the equivalent of a child's smallpox vaccination; a college education does not provide lifetime "immunity" from future unemployment or reduced income.

There is a take-away lesson for educational planning, as life expectancies increase and changes in technology and international trade patterns restructure job markets. Planning higher education as if it were a "one-time" investment for young people that will bring rewards over a growing working life is

[22] Carey and Kasunic, "Evaluating the 1980 Projections…"

making less and less sense. Increased working-life expectancy would raise the lifetime value of a college education even if all it did was add years to a working lifetime.

But that result is unlikely. More typically, the forces that increase life expectancy also accelerate economic changes that increase or decrease the market value of prior education. And the greater the time elapsed since that earlier education, the greater is the likely erosion of its market value. If that pattern is sustained, the depreciation of investment in higher education early in life would accelerate in response to technological change, and more-frequent updating of education would become more efficient.

The magnitudes of these expected changes are not trivial. According to the Milbank Memorial Fund, a foundation that supports research on healthcare policy and its results, life expectancy at birth in the United States has soared in the past century. That increase, from 55 years to 79, means that if that 24 year increase holds for college graduates of, say, age 22, the education is more likely to become obsolete while a worker is still in the labor force. The conclusion: *updating* labor market skills over a person's working life is more efficient than concentrating on it during a student's youth.

This new pattern of labor-market change and educational investment is already visible. From today's perspective, the *STEM* fields of college study-- Science, Technology, Engineering, and Mathematics – have been touted as paths to *lifetime* employment opportunity and financial success. But even apart from the wide variation in skill requirements within the overall STEM fields, an undergraduate majoring in, say, *biochemistry*, might benefit little if at all from an increased demand for *mathematicians,* physicists, astronomers, or dozens of other STEM occupations, while other uncertainties would remain. What, for example, would be the effects in STEM labor markets, of advances in Artificial Intelligence (AI) – in technologies that allow computers to learn and perform tasks typically requiring human decision makers …." ? [23]

6. Use of Endowments – Connection to Reduce Tuition and Fees

Access to college could be increased, attendance and graduation rates increased, and educational quality maintained, if only some additional revenue source could be found -- but where?

An idea for a new revenue source surfaced in 2008, particularly applicable to *nonprofit* and government colleges. Those schools had assets and income that were, and remain, largely untaxed; the prospect of levying taxes on them had appeal to revenue-hungry legislators who sought ways to generate additional revenue permitting wider student access to college, holding down tuition and fees to students and their parents, and, at the same time avoiding increased government budgetary deficits.

Congress, specifically the U.S. Senate Finance Committee, saw a solution in colleges' untapped wealth in their "endowments." If only the colleges would tap into that wealth instead of raising tuition to students and their parents, tuition could be reduced, quality could be maintained, and more students admitted. Congress pursued this potential "goldmine."

The search for a previously untaxed form of college income or wealth directed attention to the tax exemptions of nonprofit organizations, including higher education and particularly schools exempt from taxation under section 501(c)(3) of the U.S. Internal Revenue Code, and related state laws that, for example, exempted those nonprofits from real estate property taxation.

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[23] Purnell and Olson, "Artificial Intelligence…", at B1.

Three steps led Congress to enact tax legislation in December 2017, intending to induce "wealthy" colleges to change the ways they manage their endowments, to spend more of it, and to substitute that revenue for increased tuition. The three steps – in 2008, 2016, and 2017 -- provide insights to the process through which the competing goals of expanding access to higher education while controlling the costs to government, were pursued.

It was in January 2008 when the leaders of the U.S. Senate Committee on Finance sent a letter to the richest 136 U.S. colleges and universities -- those who reported "endowments" of over $500 million. The schools were asked about their spending on student financial aid, in light of the schools' wealth and "the rising cost of higher education." There was a clear though unwritten message: to remind you that your school is rich and should be using more of that wealth to hold down tuition growth.

The letter clearly involved two other stakeholders -- the Federal Government, implicitly threatening punitive taxation of wealthy schools unless they spent more of their wealth to cut tuition**,** and students, whose college access and tuition expenses depended on schools' finding alternative revenue sources. Nonetheless, the letter also signaled the thousands of less-wealthy schools that the Feds were also aiming to hold-down their tuitions.

Challenging the wealthiest colleges and universities to cut tuition by drawing-down their endowments or face unspecified penalties for their poor pricing performance grew out of a public policy anomaly; college tuitions had indeed been rising rapidly, thereby restricting broader access to college education, while at the same time, nonprofit colleges continued to be subsidized through a tax system that essentially exempted (a) donor gifts to the schools from personal income taxation, exempted (b) nonprofit and public colleges' "endowment" wealth from corporate taxation, exempted (c) the schools from taxation of their income from investments of their endowments, even if the bulk of those funds was not used to advance higher education but to further increase endowments, and (d) generally exempted the nonprofits from state and local real estate taxation. Receiving the most attention was Harvard's massive endowment, then the largest private university endowment in the world.

Something seemed awry, to a wide range of stakeholders -- to government tax-collectors and legislators in constant search of increased revenue and ways to cut expenditures, to tuition-paying students and parents, to colleges that were wealthy, or like most, had very little wealth, and to public policy makers in search of revenue to finance seemingly insatiable appetites for increased spending.

Colleges were, and still are, generally not mandated to spend any specific minimum fraction of either their endowments or annual yields, on student aid, tuition reduction, or anything else. They typically do spend, however, about 4.5 percent of their endowments annually on current educational activities, including student financial aid. Any unexpended revenues could be added, lawfully to their endowments or saved in other forms.[24]

The timing of the Finance Committee letter could hardly have been worse. Within months of its mailing, the Great Recession descended, and the value of endowments plummeted. It became evident that what the higher education economy needed was not an increase in taxation -- of college endowments or anything else -- but an economic stimulus. Discussions of plans to tax schools, their endowments, or the investment returns on the endowments, vanished. Temporarily.

[24] Foundations, however, are required to spend a minimum of 5 percent annually.

By 2016 the Great Recession was history, the economy and most collegiate endowments had more than fully rebounded. That year, a second Congressional letter emerged, again intending to incentivize wealthy schools to relax their self-imposed endowment payout rates, thereby making possible lower costs to students for tuition and other user fees. Rich schools were again targeted, but "rich" was re-defined as those with endowments over $1 billion, which affected 58 schools.[25]

The subsequent *Tax Cuts and Jobs Act of 2017 (TCJA*) brought sweeping changes to corporate and individual taxation, far beyond nonprofit colleges and their endowments, redirecting the process that the prior Congressional committee letters had initiated. The tax applied to higher education institutions, enrolling at least 500 students, with "large" endowment assets of over $500,000 per student, and a "profit" being made on their investments of endowments.[26] A new wedge was introduced in tax policy, as the wall was breached between a college's wealth and the profitability of its investments, although only for colleges, not hospitals, museums, charities, or other 501(c)(3) nonprofits.

The 2017 Tax Act was but an opening salvo in the developing battle between two forces, those fighting to make higher education more widely accessible, and those determined to control public costs, to not "break the bank" in the process of financing the education. Taxes based on assets, revenue, profit, etc. are largely untapped bases for taxation in the nonprofit sector. Legislatures searching for revenue, though, can be expected to change that in the future, by expanding tax coverage to the more than a million other nonprofits, not only colleges that continue to be tax-exempt under section 501(c)(3) of the Internal Revenue Code and that remain exempt from the TCJA legislation and its focus on only a tiny sliver of all nonprofits.

Public attention to high costs of college tuition and their continued growth of large endowments. continues. In November 2024, four major universities adopted new policies to tap their endowments and revenue sources to enable free undergraduate student tuition for those in non-rich families. This included: (a) Massachusetts Institute of Technology (MIT) – free tuition for families with income under $200,000; (b) Carnegie Mellon University – free tuition for families with income under $75,000; (c) Brandeis University – free tuition for families with income under $75,000, and half cost for families with income between $75,000 and $200,000; and (d) University of Texas - free tuition for in-state families with income under $100,000. It is hard to find any common factors among these universities; they span public and private, large and small institutions. Only MIT ranks among the top ten in terms of endowment. Regardless, this action is indicative of university concerns about the high cost of tuition and its impacts on their student bodies and finances.[27]

Besides the four listed above, in 2024 two other colleges initiated free tuition policies, enabled by large new endowments gifts: (a) Albert Einstein College of Medicine in New York – free tuition for all students; and (b) Johns Hopkins University Medical School – free tuition for families with income under $300,000. Also, (c) Harvard University added a tuition policy similar to MIT's in March 2025.

More policy changes in this direction are likely in the future, as the US Congress keeps up interest in the use of endowments for tuition as well as student loans and payments for those who default on student loans.

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[25] Tax Policy Center, *Briefing Book…*
[26] Bailey, "Tax Cuts and Jobs Act…"; Rossman & Schwartz, Endowment Tax…"; Shea, "Private Universities Protest…"
[27] Nietzel, Michael. "Leading Universities Introduce…

7. Why should higher education be thought of as primarily for young people?

In the 75 years since the end of WWII and the advent of the momentous first G.I. Bill, which opened the higher education door to over 12 million then-recent war veterans, four forces have been re-writing the conceptions of higher education -- what they should encompass, who should have access to them, and what they should be expected to achieve: (1) People are living longer and working longer; (2) women have increasingly entered the labor force, their rate of college graduation now surpasses that of men; they are marrying later in life; and they are having fewer children; (3) new technologies are revolutionizing the meaning and content of higher education in a modern economy; and (4) the expansion of global trade and just-in-time delivery, much of it made possible by declining costs of transportation and communications – all have been contributing to *uncertainty* about the future labor-market and how higher education may improve the match between employers' demands for particular skills, and employees' training for those skills.

A longer life expectancy *after* completing education generally means a longer *working* lifetime during which the investment in education can bring additional rewards. Indeed, Table 1 shows US labor force participation rates have been (and are expected to continue being) generally stable for workers under age 55, but increasing substantially for older workers --aged 55-64, 65-74, and 75+. This longer working-life expectancy translates into an expanded planning horizon for higher education. Workers' extended time in the labor force also means a longer period during which a young person's college education can depreciate or become obsolete, strengthening the case for postponing at least part of the education investment process to a later time, but how much later?

Table 1. Labor Force Participation Rate % by Age Cohort, 2002-2023 Actual and 2033 Projection

Age Cohort	*2003*	*2013*	*2023*	*2033*
16 to 19	44.5	34.5	36.9	34.3
20 to 24	75.4	70.7	71.3	69.1
25 to 34	82.9	81.2	83.8	82.9
35 to 44	83.9	82.2	83.8	82.8
45 to 54	82.1	79.7	82.1	82
55 to 64	62.4	64.4	65.8	69.1
65 to 74	21.4	26.7	26.9	30.4
75 +	5.8	7.9	8.3	10.1

Source: US Bureau of Labor Statistics, 2024 (See Bibliography)

A longer life expectancy *after* completing education generally means a longer *working* lifetime during which the investment in education can bring additional rewards. But that implies a greater likelihood that the skills developed in the education process will depreciate in market value, becoming outdated and needing renewal. In a meaningful sense the education, while seemingly sensible early in one's career, had been based on predictions of labor markets over a number of decades -- and, not surprisingly, the predictions were likely to be less accurate the longer the expected working lifetime. So, over time, a traditional college-age student is likely to be in a weaker position to choose a field of study that will prove to be consistent with the changing labor markets over his or her intended career.

Even if the student did know, with near certainty, what that preferred career was, unanticipated changes in technology, in birth and death rates, income distribution, consumer demands, and other forces affecting labor markets lasting many decades, make it illusory to believe that planning a lifetime career in one's youth is feasible in an uncertain economy.

Uncertainty, typically non-random and difficult to insure against, is a powerful force affecting career planning and the timing of education investments over a person's lifetime; indeed, they are poorly understood. In recent generations, however, "booms" and "busts" in particular labor markets – for example, for engineers, lawyers, and computer scientists -- have unexpectedly jolted these and other labor markets and the ability of graduates with these forms of college training to realize their plans.

These labor market uncertainties are the result of many supply and demand forces, including scientific and medical advances -- much coming from university research laboratories financed by government contracts and grants – as well as technology and macro-economic forces. As the body of knowledge has expanded over time, new career opportunities have been emerging, creating new needs for expanding higher education to serve a longer-living workforce. So today, college education can be thought of as serving three roles in a person's lifetime:

1) *Role 1: Education as long-term investment*, with young people spending more years in school developing labor-market skills for their expected but quite uncertain post-college careers;

2) *Role 2: Post-education labor force participation,* with workers remaining longer in the labor force, reaping additional rewards from their Role 1 investments in education; and

3) *Role 3: Post-retirement, consumption-good activity* -- after the working-life, historically in a single industry and occupation, a period of retirement may follow in which a worker's college education yields no further *investment* return, but may provide consumption benefits.

The durations and contents of the three periods continue to change over time: (a) youth now spend more years in school, resulting in some 40 percent of adults now being college graduates; (b) more post-schooling years are being spent in the labor market, particularly by women; and (c) with increasing longevity resulting from economic growth and advances in science and medicine, more years are being spent in retirement. Overall, the connections among the three segments of life have transformed society.

Multiple job changes over a worker's lifetime, and multiple occupational shifts, are becoming the new normal. Adaptation of colleges and universities to a new role as re-trainers for workers' mid-career skill redevelopments continue to adjust, and postsecondary education is an attractive venue for new programs including an increasing variety of specialized Master's Degree Programs.

8. The Rise of Master's Degrees

Not only have fashionable, if not exotic, new courses been added to what originally grew from the centuries-old British Cambridge College curriculum, so have the number of more advanced academic degrees awarded over time. When hardly anyone was a college graduate, the case for pursuing a Master's Degree to distinguish oneself from other college grads was minute. Between 1869-70 and 1909-10, only some six percent as many Master's Degrees as Bachelor's Degrees were conferred in the U.S. (Table 2, column 5). In the decade 1919-20 to 1929-1930, column 1 shows accelerated growth of new Bachelor's Degrees, more than doubling, from 48,622 to 122,484, but column 3 shows an even more striking growth of Master's Degrees awarded – more than tripling, from 4,279 to 14,969.

Table 2. Degrees Conferred by Postsecondary Institutions, by Degree and Gender: Selected years

Year	*Bachelor's Degrees*		*Master's Degrees*			*Doctor's Degrees*	
	Total	*% Female*	*Total*	*% Female*		*Total*	*% Female*
Column>>	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1869-1870	9,371	15	0	0	0	1	0
1879-1880	12,896	19	879	1	6.8%	54	6
1889-1890	15,539	17	1,015	19	6.5%	149	2
1899-1900	27,410	19	1,583	19	5.8%	382	6
1909-1910	37,199	23	2,113	26	5.7%	443	10
1919-1920	48,622	34	4,279	30	8.8%	615	15
1929-1930	122,484	40	14,969	40	12.2%	2,299	15
1939-1940	186,500	41	26,731	38	14.3%	3,290	13
1949-1950	432,058	24	58,183	29	13.5%	6,420	10
1959-1960	392,440	35	74,435	32	19.0%	9,829	10
1969-1970	792,326	43	213,589	39	27.0%	59,486	10
1979-1980	929,417	49	305,196	49	32.8%	95,631	27
1989-1990	1,051,344	53	330,152	52	31.4%	103,508	38
1999-2000	1,237,875	57	463,185	58	37.4%	118,736	45
2009-2010	1,649,919	57	693,313	60	42.0%	158,590	52
2019-2020	1,913,000	58	818,000	59	42.8%	186,000	53

Source: Derived from U. S. Department of Education, National Center for Education Statistics, 2022

The pattern of faster growth of new Master's Degrees relative to new Bachelor's degrees is consistent with more than one model of demand for higher education. The expansion of scientific and technical knowledge could increase the market value of a college education, and even more so for the insights conveyed through a Master's Degree. But it was and is also the case that with more people graduating from college, prospective employers might search for instruments to sort-out the graduates who were more and less productive job applicants, and completion of a subsequent Master's Degree could serve that signaling function, even if the education itself produced no increase in productivity.

There is another caveat relevant to interpreting the long-term increase in Masters' programs compared with Bachelors.' In general, the two decisions – to attend and to graduate from college, and to attend and graduate from a Master' program, are not made by a student in the same year, although the table below implicitly assumes they are, or that the 1–2 year time lag does not distort the picture of their relationship over time**.**

The growth rates of degrees in the 150 years covered in Table 2, between 1869 and 2020, began in a period of stability; between 1879 and 1909 the annual number of Master's Degrees awarded was in the range of 6 -7 percent of the growing number of Bachelor's Degrees awarded in a given year, and it remained in the single digits for another decade. In the first half of the 20th century, new Bachelor's Degrees continued to increase, but Master's Degrees grew faster, reaching double digits of 12-19 percent of the number of Bachelor's Degrees awarded between 1929-30 and 1959-60. Since then, the awarding of Master's Degrees continued to grow still-faster than that of Bachelor's Degrees – reaching 27 percent of the number of Bachelor's degrees awarded in 1969-70 and continuing the upward trajectory for at least the next half-century, reaching 37 percent in 1999-2000, and into the 42-43 percent range by and after 2009-2010.

As the higher education industry grew in number of colleges, their geographic accessibility, the industrial diversity of the economy and the widening expanse of occupational choices outside agriculture, students have become more able to distinguish themselves from each other in their labor market pursuits. College graduations have been soaring, an increasing proportion of the graduates have been continuing their schooling by moving into and completing a Master's Degree program, as column 5, shows. And most remarkably, the awarding of Baccalaureate, Masters, and Doctoral degrees by females over the past 150 years have transformed all three of those markets from total domination by males in the century between 1869-70 and 1969-70, to essential equality in market shares, or at least the near disappearance of inequality by 1979 - 1980.

Implications for the Future of Government and Higher Education in the U.S.

The history of America's colleges and universities shows how they have played and continue to play a pivotal role in the development of the nation's economy, through scientific research enabling technology development, workforce training to meet the changing mix of social and economic activity, and cultural industries including sports, arts, music, and literature. The US Congress has enabled much of this change over nearly two centuries, from the initiation of land grant colleges and research stations in the mid 1800's, to the expansion of workforce development though the GI Bills of Rights and tuition loan and grant programs starting in the mid 1900's. More recent actions by higher education institutions to expand course choices, faculty arrangements, and degree offerings can all be seen as efforts to increase flexibility and capability to serve broader populations and needs of a changing economy. That effort has also been supported further in recent decades by federal government tuition grant and loan subsidies.

As the role of colleges and universities have come to serve broader populations and sectors of the economy, it makes sense to consider how these changes affect expectations and objectives for stakeholder groups. The principal stakeholder groups and some of their key concerns are: (1) ***students*** – degree and course choices, instruction settings, costs, and returns; (2) ***faculty*** – teaching, research, and compensation; (3) ***educational institutions*** – tuition revenues, endowment assets, and property rights; (4) ***public policy for government*** – subsidies, expenditures, and measuring benefits; and (5) ***private industry*** – depth and breadth of scientific research and workforce skills coming from universities.

The eight themes identified in this paper all point to a continuing tension and interplay between funding and returns on those investments for the various stakeholder groups. They further point to a need for clear recognition of the broad and varied performance roles and expectations of higher education institutions, as well as the existing financial incentives affecting them. Performance expectations and incentives have been changing and evolving for multiple centuries, and change will undoubtedly continue beyond today's politics. But care is needed to ensure that there is explicit consideration of the different stakeholders and their needs and resources going forward.

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