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Introduction

Markets for information do not work, and as a result, successful educational institutions must find a way to evade or overcome market failure. The basic problems, if not their jargon, are intuitive: the sunk cost problem and the trust problem. Historically, successful universities mitigated both by a combination of cross-subsidies and structures designed to preserve reputation. Today, however, intense market pressures threaten both mechanisms.

The Sunk Cost Problem

The sunk cost problem is the technical term for J. P. Morgan’s “ruinous competition,” his insight that free markets in capital-intensive industries, unless restrained by bankers like himself or monopolistic mergers, lead to crisis and underinvestment. Sunk costs—meaning investments that have already been made and cannot be undone—earn no return in competitive markets, which reward only marginal cost—the cost of the last unit of production. When marginal costs are lower than average costs, investment earns no return in competitive markets.

Examples abound. It costs a great deal to build a railroad, a sunk cost, but not very much to add an additional, or marginal, passenger. A computer chip factory requires a huge initial investment, but then it can efficiently convert sand and cheap labor into millions of chips. Pharmaceuticals, software, novel financial instruments, e-books, and music tracks cost a great deal of money to design or create but very little to produce.

To revisit the railroad example, once the initial investment in tracks and staff is in place (the sunk cost), railroads make more money running trains than sitting idle so long as they sell enough tickets to cover the cost of fuel (the marginal cost). Once the railroad is committed to running the train,
every extra ticket sold is additional income with virtually no extra cost. A railroad vying for that extra income before its competitors take it will force prices down to the cost of carrying an extra passenger—that is, virtually nothing. If prices fall below the cost of maintaining tracks, training engineers, and developing next-generation infrastructure, the system is doomed to fail. Worse yet, if this problem is obvious in advance, producers, realizing that profits are unlikely, will never enter the market in the first place. Left to itself, even with willing sellers and buyers, the market described in this example effectively and efficiently generates nothing at all. Thus, some way must be found to escape the market’s invisible hand.

Universities exist because of the sunk cost problem. Philosophy, the arts, and sciences—useful information in general—are extremely costly to create; researchers and artists must be trained, experiments must be run, data must be analyzed, and thoughtful people must be paid while they think, compose, tinker, or struggle with sentence formation. In contrast to the high costs of creation, the knowledge, ideas, or writing that result are often cheap to reproduce and distribute. If prices reflected marginal costs, books would sell for little more than the cost of paper and retailing; ideas would be priced as so much hot air.

The Internet makes this problem worse. The marginal cost of distributing and consuming lectures, books, newspapers, photographs, research, formulas, music, and movies is approaching zero. Moreover, the artificial monopolies of copyright and patent—intended to free producers from competition and, therefore, marginal pricing—are increasingly easy to evade. Left unchecked, competition will press prices down well below the point at which it is possible to cover the fixed costs of people thinking, creating, researching, collecting, analyzing, and writing. If they can’t make a living doing those things, they are likely to do them less. Adam Smith’s invisible hand will ensure that individual actors pursuing their individual interests will leave us collectively worse off.

The Trust Problem

Furthermore, markets for information suffer from a trust problem. In any market, reasonable buyers demand assurance that sellers will actually deliver what they have promised. Ordinarily, the best way to demonstrate that a product is as valuable as the seller contends is to let the buyer try it out—take it for a test drive, use it at a friend’s, or see the product demonstrated. However, many purchases or experiences are essentially one-shot. By the time you can evaluate most movies or exotic vacations, you are not
a customer anymore. Similarly, to show a prospective buyer how good or useful an idea is, the seller must disclose it; but once the buyer has it, why pay for it? Conversely, if buyers are willing to pay before knowing whether the concept is worthwhile, why should the seller deliver? The free market result is a market for lemons, in which willing buyers and willing sellers fail to make a deal.\footnote{1}

Universities, especially tuition-driven institutions that attempt to pay for the production of knowledge by selling education, are organized in response to the trust problem. In order to know, firsthand, the quality of education an institution offers, the consumer has to actually live an educated life. That is, consumers must themselves be educated to see how well their education has prepared them and to be in a position to evaluate the quality of education an institution offers. An institution that deferred charging until then would run into a free-rider problem.\footnote{2} Conversely, and more commonly, schools can charge in advance, but this merely shifts the free-rider problem to the other side: how are consumers to know that the institution will provide the education or status that entices them to enroll?

Reputation can solve the trust issue when buyers believe past performance predicts future quality, so that students and their future employers believe the university has the ability and incentive to produce future education and graduates commensurate with its past. But the end game always poses a problem to reputation-based systems: especially near the end of their careers, sellers may be tempted to mine their reputation by cutting quality and overcharging until buyers catch on. If buyers worry about this kind of defection, sellers may instead defect in the penultimate period—and so on, until the entire reputational gambit fails.

Reputation can create trust only if institutions (individuals can never do it on their own) can credibly deter defection. In universities, faculty governance, peer review, and alumni influence all help reduce the likelihood of defection: alumni and faculty may have personal reputations tied to the institution and, as groups, overlapping time frames with no end point, or penultimate period. Still, administrators may be sorely tempted to win quick reputational gains by shifting resources from long to short term—the academic equivalent of killing the R&D department in favor of better advertising—on the assumption that they, the administrators, will be able to move on before the price comes due. At successful institutions—Harvard, for example—such short-termism would be quickly discovered and harshly condemned by powerful actors with longer-term commitments. For younger alumni and faculty, the long term is far more important than momentary gains. At less prestigious institutions, by contrast, there may be
no countervailing forces powerful and committed enough to resist. Then, as potential students, employers, and mobile faculty become aware that reputations are ephemeral, or easily manipulated and exploited, the trust problem might quickly create self-fulfilling pressures to short-tenurism or churning.

**Today’s Universities: Navigating Sunk Cost and Trust Problems**

American colleges and universities have mitigated the sunk cost problem by cross-subsidization, that is, by depending on alternative sources of income. This allows them to give away their chief products, as market competition would pressure them to do anyway.

Private schools sell a package of undergraduate education, status markers of the type Veblen made famous, and services to help adolescents transition to adulthood at handcraft rates reflecting both the high cost of unmechanized services and the conspicuous consumption value of prestige. Prestigious private institutions supplement tuition with a good deal of begging, or the selling of potlatch prestige (or whatever it is that motivates donors to want their names on educational real estate); endowed and land grant schools also add profits from their real estate, investing, and hedge fund activities. State institutions, like most European schools, traditionally depend on state budgets; research universities are heavily supported by federal grants. Until fairly recently, medical schools were able to use the medical insurance system to charge more than the marginal costs of care, thus cross-subsidizing the costs of educating doctors. Professional schools can charge more than cost because they offer students admission to restricted professions, and students pay the price because the same restrictions limit competition after graduation and allow them to charge a higher price for their own expertise (a sunk cost itself). These partial monopolies, traditionally accompanied by professional norms that limited price competition, protect schools and professionals alike from the corrosive effects of marginal cost pricing.

But cross-subsidization is always unstable. Cross-subsidies depend on excess profits somewhere else. In turn, excess profits invite competitors attempting to seize some of them by reducing price. Thus, competition always threatens to reduce prices to marginal cost and eliminate the profits on which a cross-subsidy depends. Thus, hospitals that are subsidizing medical education must charge more than ones that do not; in competitive markets, nonteaching hospitals will drive them out of business or force them to reduce prices until the subsidy is gone. Professional schools that
profit from limits to entry also face enormous temptations to cheat: each additional student represents immediate income, while the costs are nearly all borne by future professionals, who will face more competition and a lower lifetime income, or by customers, who will face reduced services if the profession becomes unprofitable.

Universities charge students more than the cost of teaching alone. Besides teaching, faculty are paid to research, write, think, educate themselves, supervise each other, and police the institution’s quality. Specialized teachers, who would pass on existing knowledge without being paid to create new knowledge or even maintain their own expertise, would be cheaper. Often, costs could be cut even further by automation: for example, by replacing the hand grading of papers with multiple-choice tests. To be sure, teaching quality drops when faculty are no longer paid to maintain or increase their knowledge, or when the handwork of guiding an apprentice is replaced with automated sorting systems. Nonetheless, in a fully competitive market, the university as we know it would quickly become an endangered species.

An Entrepreneurial Model for Educational Institutions

An innovative institutional model could, in theory, survive these market pressures. An entrepreneurial profit-maximizer could simply eliminate the cross-subsidies and cut prices closer to the marginal cost of education alone. Rather than paying to support training the next generation of faculty, to maintain the skills of existing teachers, or to support research or scholarship, an entrepreneurial institution would seek to limit itself to the sale of teaching.

Teaching, if done right, will always be expensive; there is a certain amount of handwork involved in explanations and editing that is difficult to automate. Nonetheless, the marginal cost of adding one more student to an existing teacher’s portfolio is quite low. It can be lower still if the teacher lectures via movie, grading is shifted to lower-paid piece workers, and the most difficult to automate aspects of apprenticeship and mentoring are simply abandoned. More radical innovators could apply Taylor’s principles of scientific management, trying to work out the components of effective teaching and using them to train low-wage replacements for the skilled guild.¹

This is, of course, precisely the model of test prep and bar review courses, much of the online and for-profit education industry, and our community colleges. Existing academic stars and experts are used for headline teaching,
while explanations and grading are automated or shifted to cheap labor, reducing prices dramatically. This route, then, may be highly attractive to consumers and producers alike for a brief period. Students could get cheaper education from better-known faculty; the best teachers would be paid more and—more attractive still—would be able to teach larger numbers of students.

Less radically, the aforementioned entrepreneur could simply hire more adjuncts, post-docs, and similar academic migrant workers. Trained PhDs or engineers have already made their investment in training; their own education is a sunk cost. Without the cross-subsidies and limits on the market of traditional universities, competitive markets will drive team, like railroads, to charge no more than marginal cost—not enough to earn a decent return on the time, effort, and tuition in obtaining the skill or to attract informed newcomers into the field, but just enough to be more attractive on any given day than driving a taxi.

The costs reductions are not from increased efficiency. Instead, students are no longer being asked to pay for the education of the faculty, research, or the creation of new knowledge and cultural artifacts. They are not even paying for maintaining the reputation of the institution, which instead buys existing reputations on the cheap (in the form of its headline teachers). The cheap price results from eliminating the cross-subsidy. But this means that a university system based on marginal cost pricing is self-destructive. The end of the cross-subsidy means that developing expertise and advancing human knowledge will not earn returns. As in any industry where average costs exceed marginal costs and competitive markets price at the margin, the message to those who might enter the field is clear: don’t. There are easier ways to earn the living of an adjunct professor.

Even if the professoriate disappears as a middle-class profession, some individuals may be willing to do it as an avocation—living the romantic life of La Bohème or the privileged life of Victorian aristocratic amateurs. A handful of institutions—like Harvard and Yale—may have large enough endowments to support graduate education and creative research work on their own, although even the wealthiest schools would be hard-pressed to support modern scientific research and advanced medical training on endowments alone. The potential number of amateur physicists (for instance) is small, and few American universities and colleges have large enough endowments to pay the fixed costs of education, let alone research, without tuition support.

Much of U.S. productivity, in the crudest sense, freeloads on the university system. For a century, the cross-subsidies of the academy have provided
shelter from market pressures that would destroy productive research, by hiring artists, musicians, writers, mathematicians, biologists, economists, physicists, and critical critics to teach and leaving them time for their other work. The wisdom and research that these scholars contribute to the world for free is then available for others to use—for their pleasure, for the social good, or, if they can figure out a way to monetize it, for profit. For example, fundamental research in biology is done in the universities, not in the pharmaceutical companies, because the universities can support it and the companies cannot. To be sure, Bell Labs did great work, and Google pays for undirected creativity today, but these firms cross-subsidize from their monopoly profits, and the former exists no more and the latter might, presumably, succumb either to competition or to the temptation to use its profits otherwise. The core of research and creative work in our economy occurs in universities; if we let them go, we have no reason to expect that their task will be taken up magically by a new, or as yet nonexistent, institution.

Reenvisioning Economics of Education in the Age of Social Media

In short, new information technologies and social media present massive challenges to the economics of education, and to the future of our institutions. These challenges are also playing out in other industries. Journalism, for instance, is a core part of our system of democratic government. If we no longer have a way to pay professional journalists, we have lost something essential. But journalism is relatively cheap; perhaps we will be able to endow research foundations, or shift investigative journalism into the universities. If we lose the universities, we will endanger the soul and brain of our civilization.

To be sure, the world will not end if the academy downsizes to a handful of great institutions able to survive because of endowments or government support, accompanied by a larger number of teaching schools, looking more like community colleges than today’s state or private colleges. But shrinking the academy will have important losses: less range of discussion, more inbreeding, fewer graduate students, smaller audiences for the few who remain, and, most important, more aspects of our governing institutions and cultural mores with no critics watching them at all.

Next, I consider one innovative model for the modern university: University of the People (UoPeople), which was introduced in chapter 11. In one sense, it is the People’s Express of the academic world: the wild efflorescence of new opportunity possible as the old system collapses. At the
beginning of airline deregulation, People's Express reduced airfares and enormously expanded access to travel before succumbing itself to the inevitable pressures of marginal cost pricing. The UoPeople model similarly offers opportunities to everyone that formerly were restricted to the rich. It does this by stripping the service, education, down to its bare core, transforming it in the process. The UoPeople experiment is one to watch. Will it be a harbinger of a new era, or will it destroy itself in its Samson-like declaration of independence?

I am hopeful that UoPeople will survive and prosper, that it will be a transformative experience in the lives of many students, and that it will prove a footnote in our march toward a new system of financing education or a successful rebuilding of the old one. Information wants to be free, said the Internet ideologues. UoPeople is trying to make it so.

Challenge: Infrastructure

Despite the extraordinary potential for transforming the economics of education described above, the case of UoPeople, operating as a nonprofit, tuition-free, accredited online university, is not without its challenges. While information wants to be free at the margin, it is quite expensive to set up. UoPeople needs an infrastructure: coders to design and maintain its websites, people to read and verify applications, others to coordinate volunteers and pinch hit when they punt, as volunteers often do. To work, the model needs lawyers to press for accreditation and to navigate education laws all over the world, staffers to consider novel issues of student discipline online, and so on. Even seemingly simple issues become expensive, especially when its administrators are seeking to keep the budget minimal—expensive and frequently personally painful. What is to be done about the rural student who is four days' journey from a notary who could certify an English-language translation of his high school diploma, the war refugee who cannot possibly obtain a copy, or the student who fills a classroom's online forum with racist rantings? UoPeople cannot shift entirely to the automated "customer service" of some computer companies, where a software program attempts to guess what the problem is and matches it to a canned solution. Someone needs to do the work to find the relevant information.

Challenge: Need for Expertise

More than infrastructure, though, nonprofit, tuition-free, online universities such as UoPeople need expertise and information. Courses can only be
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created, evaluated, updated, and maintained by experts who know the materials they seek to teach. The UoPeople’s plan is for these experts to be volunteers—that is, professors paid by some other university, or retirees living on the proceeds of a career at another university. As a unique or highly unusual service to the poorest sectors of the potential student population, this university hopes it can attract qualified people willing to donate enormous amounts of time.

It is not yet clear whether this is a realistic expectation: preparing a course is a huge amount of work, doing it well is even more work, and doing it in an unfamiliar medium and format without ongoing student feedback is likely to prove more than most volunteers are able to take on. It is already clear that every course must be edited, formatted, and monitored by a paid staffer. It may yet turn out that many also need to be written and peer-reviewed by paid experts; if we reach the stage where distributing existing information is free, it will only be after quite a bit of expense.

Challenge: Scale and Sustainability

Moreover, it is still unclear whether UoPeople can represent a sustainable model for more than the niche of the education market it has currently carved out (i.e., business and computer science education). Its volunteers need to eat, pay rent, and educate their own children. They can do this only if they have jobs elsewhere. They need to be qualified to teach, which means they must have the time to develop their own knowledge and keep it up, and they need to have studied with someone else, who similarly must have been educated.

UoPeople anticipates enormous returns to scale. It anticipates that the same web staff will be able to handle a website for thousands of students as for dozens. Developing courses is major work, but once developed, courses may have a long life span and not require inordinate numbers of volunteers to create new ones and update old ones. The UoPeople’s plans for grading and discussion rely largely on peer-to-peer networks—that is, advanced students assist beginners in the system. Such an apprenticeship model becomes more plausible as the UoPeople community grows larger. With tens of thousands of students, some may be interested and competent enough to run the discussions and maintain a wiki-like self-ordering community. One assumption built into this model is that size will create something new and different that does not exist today and cannot exist in a smaller environment.
But ultimately, the model is not socially self-sustaining. It requires and expects continuing, ongoing support from better funded professionals. Those professionals can only be sustained by fully funded universities and can only be sustained by the larger ecosystem gathered around the universities—the opportunities for students, the expectation that reasonably good students will be able to pursue careers in subjects without immediately salable marginal product, the critical mass of scholars and students and teachers to sustain an intellectual discussion and prevent it from turning inward and sterile.

Conclusion

In the end, the question is not one of markets but of politics. If we—collectively, the people of the rich countries—value our cultures and if our political institutions are functional enough to instantiate that value into real support, we will find ways to pay for our core educational institutions, including traditional universities that take the production of knowledge, not just its dissemination, as their mission. In that event, nonprofit, tuition-free, online universities such as UoPeople could be an extraordinary monument to the power of entrepreneurial vision and volunteerism. But UoPeople depends on the wealth of knowledge and skill those core institutions create; it cannot replace them.

We could accept that information is not going to be produced adequately by the market—and is essential for markets to function successfully. Thus, we could simply agree that we need government-financed universities as badly as we need government-financed prisons, wars, and highways. It is simply unfair to our youngsters to require them to pay for the production of the knowledge we all need. Perhaps we will try radically shortened patent and copyright terms, allowing information to flow more freely and avoiding the side effects of governmentally created monopolies, much as we did for physical infrastructure in the early nineteenth century (see the Charles River Bridge controversy). We could instead finance discovery and innovation more efficiently and cheaply with a prize system, financed by taxes and administered by the NIH/NSF or delegated in part to relevant university and industry research departments. Perhaps the process of finding new ways to pay for the creation of knowledge and skill would be eased if we changed governmental accounting norms to reflect that these expenses are investments, so that much of current year "deficits" ought instead to be recorded as "saving for the future."
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Notes


5. Proprietors of Charles River Bridge v. Proprietors of Warren Bridge, 1837 (overturning a government grant of monopoly to finance a bridge, and thus forcing governments to find different ways to finance such infrastructure).

Bibliography


