The Idea of the University: The Corporate University or the High Seminary of Learning?

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Good afternoon. I would like to start by thanking both President Jim Barker and Dr. Bill Maker, Chair of the Department of Philosophy and Religion, for inviting me to come and speak to you today. It is a great honor and pleasure to be here.

Yesterday, driving in the car from the airport, Dr. Maker and I discussed the recently proposed budget cuts, which the South Carolina legislature is considering, and how they would impact Clemson University and higher education more generally. In coming to speak to you today, I am very sympathetic to the budget pressures that you face. Unfortunately, as you are no doubt aware, many state governments across the country are cutting back state support for higher education, which in my own view is extremely shortsighted. Many states are also simultaneously asking their colleges and universities to become engines of local economic growth, and encouraging them to generate more of their financial support from private industry. I hope that my talk, which explores this national trend, will make a compelling case for why it is a mistake to force universities down this path....

INCREASINGLY, WE LIVE IN AN AGE where ideas are seen as commodities and the control of information is central to our economy, so it's really no surprise that, in this context, universities are coming to be seen as incubators of new ideas and are being asked to play a more prominent role in fueling our nation's economic growth. Both the biotechnology and computer engineering revolutions were largely born out of university research labs, after all.

Yet my *Atlantic Monthly* article—which I co-authored with another journalist, Eyal Press, and which involved extensive research and interviews on numerous campuses—contends that without adequate safeguards, the growing ties between the academic world and industry threaten to undermine the university's unique role in our society as a place of disinterested inquiry, basic non-directed research, and critical thought.

Now I realize that that is a big claim. So what's my evidence? Well, the first place my research took me for the *Atlantic* article was the University of California at Berkeley—one of our nation's preeminent public universities—which in November, 1998 signed a five-year, 25 million dollar sponsored-research agreement with Novartis, a Swiss-based pharmaceutical company and producer of genetically engineered crops. (I should note that Novartis has since spun off its agricultural division, now called Syngenta, from its pharmaceutical division, but for the purposes of this talk I will continue to refer to the company as Novartis since that was its name at the time the deal was signed.)

The Novartis agreement provoked an uproar on the Berkeley campus, and has since led to hearings in the California State Senate, because many people both on and off campus felt that several key provisions of the deal seriously compromised academic freedom.

- First, the deal allowed one private corporation to provide 1/3rd of the research budget of an entire department—the Department of Plant and Microbial Biology—at a public university.
- Second, the deal granted the company first rights to negotiate licenses on up to 1/3rd of the Department's discoveries, including research that was funded not only by Novartis, but by federal and state sources as well.
- Third, Novartis was given 2 out of 5 seats on the university research committee, which sets the research agenda for the Department and chooses which projects to fund.

The Novartis deal left the faculty in Berkeley's College of Natural Resources deeply divided. A faculty survey conducted after the agreement was signed revealed some striking findings:

- Although 41% of the faculty in Berkeley's College of Natural Resources supported the agreement as signed.
- Over 50% believed it would have a "negative" or "strongly negative" effect on academic freedom.
- Roughly half believed it would erode Berkeley's commitment—as a land grant university—to "public good research."
- And another 60% believed it would impede the free exchange of ideas within the university, which is really the hallmark of academic life.

One professor I spoke with, Ignacio Chapela, then-chairman of the College of Natural Resource's Executive Committee, a faculty governing body, told me—when—I visited Berkeley—that he no longer felt he could talk freely to his colleagues in the Department of Plant and Microbial

Biology. The reason? He knew professors within the Department were now obligated to keep proprietary information secret and he, himself, was afraid to share ideas that might then be handed over to Novartis. It's worth noting that Chapela is not a knee-jerk critic of university-industry alliances. In fact, before coming to Berkeley, he spent three years working for none other than Novartis—then named Sandoz. But Chapela does object to the way this deal institutionalized Berkeley's relationship with one company.

Was this deal just an aberration? In many ways it was not: Since 1985, corporate funding of universities has grown from $850 million to over $4.25 billion. Washington University has a long-time agreement with Monsanto, for example; MIT has a $15 million agreement with Merck & Co; and Harvard's Beth Israel Deaconess Hospital is currently soliciting bids from 40 companies to conduct joint research at a new medical facility.

Another marked trend is the boom in industry-endowed chairs:

- Freeport McMoRan, a mining company—which several years ago was the number one polluter of water in America—now holds a chair in environmental studies at Tulane;
- Kmart has endowed a chair at West Virginia University, which requires its holder to spend up to thirty days a year training store managers.
- Elsewhere, buildings, athletic complexes, in some cases whole academic departments, bear the names of corporate sponsors.

The growing commercialization of the academy can be traced to the Bayh-Dole Act of 1980, which allowed universities to patent federally-funded research for the first time. Congress' intent in passing Bayh-Dole was to bring ideas out of the ivory tower and into the marketplace more quickly to help fuel U.S. economic growth. And I think to a large extent it has achieved this objective.

There are still no independent economic assessments of Bayh-Dole's impact, but AUTM—a group of university technology managers—estimates that some 2,500 new start-up companies have spun directly out of academic research labs since Bayh-Dole, which is why you see a clustering of biotech and computer firms around universities in the Research Triangle, Silicon Valley and beyond. Over the last decade, moreover, AUTM estimates that new patents filed increased 77%, and new licenses and options executed increased 129%.

But other factors have also pushed universities to seek a growing portion of their funding from industry. These include:

- The growing cost of doing research
- A leveling-off of federal science funding (in all areas except biomedical research).
- And a serious decline, in many parts of the country, in state support for higher education.

While the federal government still supplies a majority of the funding for academic research (60% or about $14.3 billion)—the corporate share is growing. From 1980-1998, corporate-sponsored research expanded 8% annually, rising to $1.9 billion in 1997—or nearly eight times the level of twenty years ago.

Finally, in addition to Bayh-Dole, it is important to note that Congress has passed numerous additional laws and tax breaks designed to nurture university-industry collaborations. Because so many federal grants now involve financial cost-sharing with industry, it has been estimated that the private sector probably influences somewhere between 20-25% of academic research.

The problem, I believe, is not university-industry collaborations. The problem is that universities are increasingly allowing industry to dictate the terms of their support in ways that fundamentally threaten academic freedom and the ability of the university to remain free of vested interests.

Put another way, the university—which is, really, the embodiment of our "common heritage"—is rapidly losing sight of the fact that serving private industry, is not the same as serving the public interest. The American Association of University Professors expressed this beautifully in 1915:

"All true universities, whether public or private, are public trusts designed to advance knowledge by safeguarding the free inquiry of impartial teachers and scholars. Their independence is essential because the university provides knowledge not only to its students, but also to the public agency in need of expert guidance and the general society in need of greater knowledge..."

In my talk, I will focus on three main areas of concern:

First, the growth in corporate-sponsored research poses a threat to the open culture of the university, the right to publish, and the ability of professors to perform disinterested research that the public can trust.

The days of unrestricted private grants appear to be disappearing. Increasingly, corporations are unwilling to invest in academic research unless they can in some way control the results, which frequently means that corporations require professors to sign agreements laced with restrictive provisions, including, for example, requirements that investigators keep both the methods and results of their work secret for a period of time.

- A recent study in the Journal of the American Medical Association (JAMA) found that 1 in 5 scientists delayed publication for more than six months to protect proprietary information. This despite the fact that the National Institute of Health (NIH) recommends that corporate sponsors be given no more than a 1-2 months delay on publication, which is sufficient time to apply for a patent.

Many scientists also report having an increasingly difficult time accessing basic research tools due to proprietary restrictions.

Steven Rosenberg, one of the country's leading cancer researchers at the National Cancer Institute, told me that he is often asked to sign agreements to gain access to reagents that require him to keep the results and methods of his research secret for up to ten years. Rosenberg has become so alarmed about this threat to the open exchange of information and research materials that he has called on professors and research institutions to reject these confidentiality agreements on principle—but unfortunately (as I'll discuss later in my talk) few institutions have heeded his call.

Beyond the question of secrecy lies a more serious concern: namely, the potential that companies will influence the design—and in some cases the results—of the studies they pay for.

In a recent article published in the *New England Journal of Medicine*, Dr. Thomas Bodenheimer, an internist and professor at the University of California at San Francisco (UCSF), conducted an extensive search of the medical literature and concluded that, over the past decade, the arms-length relationship between academic-medical researchers and their sponsors has dangerously broken down.

Bodenheimer found extensive evidence of:

- publication bias (a tendency among corporate sponsors to publish only results that are favorable);
- ghostwriting (wherein companies pay scholars to add their names to journal articles written by corporate marketing departments).

- And study-design bias. One study published in the Archives of Internal Medicine, for example, found that in 54% of company-sponsored arthritis-drug trials, the dose of the funding company's drug was higher than that of the comparison drug, increasing the chances that the funder's drug would appear more effective.

Bodenheimer also found that companies now frequently retain control over the raw data from a clinical trial, making it far easier to spin the results. Some principal investigators have the capacity to analyze all the data from a large trial. But increasingly, according to Bodenheimer, "companies prefer to retain control over this process." An executive at one company told Bodenheimer, "We are reluctant to provide the data tape [containing the complete clinical trial data] because some investigators want to take the data beyond where the data should go."

- Dr. James Kahn, an AIDS researcher at UCSF recently experienced this phenomenon first hand. Last year, when Dr. Kahn and another biostatistician at Harvard, Dr. Stephen Lagakos, attempted to publish new research showing that an AIDS therapy was ineffective, their corporate sponsor, Immune Response, tried to block publication. According to the researchers and UCSF, the sponsor refused to release the complete data from the trial. Still, Kahn and his colleagues pressed ahead with what they estimate was 95% of the critical data set, publishing an article in *the Journal of the American Medical Association* last year. But the company quickly responded by taking legal action against Kahn and the University, filing for $10 million in damages.

Now some would say that stories like Dr. Kahn's are exceptional. In fact, however, the list of such cases appears to be growing; I know of four other high-profile cases besides Kahn's.

And, unfortunately, in some cases, the universities themselves have bowed to industry pressure, rather than defend their researchers.

- In 1996, for example, David Kern—the former director of occupational medicine at Brown University—was working under a sponsored-research agreement. In the midst of this, he wound up discovering evidence of a dangerous new lung disease spreading among workers at a Rhode Island factory. But when Kern tried to publish his findings, the company threatened to sue, citing a confidentiality agreement that forbade the disclosure of "trade secrets." In reality, Kern's own research involved no trade secrets—he was imply trying to document the existence of a new disease—which, by the way, was eventually recognized by the Center for Disease Control. But Brown

University, rather than defending Kern, tried to dissuade him from publishing. Shortly thereafter his position was eliminated.

Mildred Cho, a researcher at Stanford's Center on Biomedical Ethics, points out that for every James Kahn or David Kern who steps forward to oppose this overt form of corporate influence, there are an unknown number of researchers who may voluntarily design their research in such a way that it is more likely to reach conclusions favorable to their corporate sponsors.

Cho is suspicious of bias for good reason.

- In 1996, Cho published a study in the Annals of Internal Medicine, which found that 98% of industry-sponsored drug research studies reflected favorably on the funding company's drug, versus 79% of non-industry funded studies.

Numerous other studies have revealed similar disparities, suggesting that when research is industry sponsored, there is a higher likelihood that the results will favor the corporate sponsors' interests.

- A study published last year in JAMA, for example, found that non-profit funded studies of cancer drugs were eight times more likely to reach unfavorable conclusions than industry-sponsored studies.

- Another analysis of 70 studies of cardiac drugs (calcium channel blockers) found that 96% of authors who were supportive of these drugs had financial ties to the manufacturers, whereas only 37% of authors who were critical had such ties.

Now, obviously, the fact that a professor receives industry funding does not mean that his or her research is necessarily biased. But will the public continue to trust academic research to the same degree? Should the public?

What's particularly troubling is that many professors performing sponsored research also have extensive financial ties to the companies sponsoring their work:

- Sheldon Krimsky, an expert on conflicts of interest in science at Tufts, examined over 800 scientific papers published in a range of academic journals and found that slightly more than 1/3 of the authors had a significant financial interest in their reports. These interests included having a seat on the corporate sponsor's board or owning stock, for example.

- Even more alarming, according to Krimsky, these ties are rarely disclosed. Krimsky examined 62,000 research articles and found that corporate financial ties were disclosed only .5% of the time.

Now even those who discount the significance of such findings should, I think, be concerned that, in the absence of strong disclosure and strong oversight policies, such ties could undermine the public's trust in science—and perhaps even in universities, themselves.

This danger was brought home dramatically after Jesse Gelsinger, an 18-year-old boy from Tuscon AZ, died in a gene-therapy experiment at the University of Pennsylvania in September 1999. In the Gelsinger case, both the lead researcher and the university owned stock in the company funding the clinical trial. Of course, the deeper problems at U. Penn involved serious medical and ethical violations by the lead researchers. These included failing to properly report serious adverse events, and withholding evidence that monkeys undergoing similar treatment had died in earlier experiments. But the potential for financial gain really alarmed the public, and rightly so.

After Gelsinger's death, the Federal government found that numerous other gene-therapy researchers—many of whose experiments were funded by their own start-up companies—had similarly failed to report adverse events and even deaths, as required under federal law.

Moreover, since 1999, at least eight universities have had their research restricted or shut down completely by federal authorities, due to their failure to properly oversee human clinical trials.

As David Korn of the Association of American Medical Colleges recently noted, if we expect the public to continue funding academic research and trusting the results, "even the perception that faculty investigators or their institutions have financial interests that might compromise their independence and credibility cannot be tolerated."

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There is a second problem with the way commercialism is being pursued on campus today. In their eagerness to cultivate alliances with industry, universities are beginning to look and behave like for-profit companies themselves.

- Schools like Johns Hopkins now operate their own internal venture capital funds to bankroll commercially promising lines of research.
- And many universities, themselves, are now investing heavily in the companies sponsoring their professors' research, creating the potential for serious institutional conflicts. In the 1980's and 1990's, for example, Boston University plowed nearly a fifth of its endowment into a biotech firm, found by several BU professors. Later, when the company's stock plummeted, the university was accused of egregiously mismanaging the school's endowment to prop up the company and protect the trustees' investments.

Meanwhile, universities also have taken to guarding their intellectual property aggressively as any business would.

Traditionally, universities regarded patents and other intellectual property restrictions as standing in direct conflict with their role to disseminate information as freely as possible. But today, as a result of Bayh-Dole, most schools have technology licensing offices dedicated to commercializing their professors' discoveries and managing the university's burgeoning patent portfolio.

Of course, on its face, there is nothing wrong with this activity. But where should universities draw the line between their own commercial interests and their commitment to serve the public good?

- A National Institute of Health (NIH) working group recently expressed alarm that universities are no longer freely exchanging basic research tools and reagents among scientists—even when these basic scientific building blocks have been developed with federal money—because they are aggressively laying proprietary claim to these discoveries to earn future royalties.
- The NIH was shocked to discover that universities now impose proprietary claims on basic research tools that are as restrictive as those applied by private industry (including requirements that the university be allowed to review manuscripts prior to publication, and provisions extending their ownership claims to any future discoveries.)

Universities, the NIH wrote, "have no duty to return value to shareholders, and their principal obligation under the Bayh-Dole act is to promote utilization, not to maximize their financial returns."

When universities do act to maximize their financial returns, they also raise questions about their non-profit status? Universities, after all, are tax-exempt in large measure because it is assumed they are performing

certain functions that will benefit the broader public, not merely their own bottom line.

The consequences of imposing excessive proprietary constraints on information could be profound, especially in an era of expanding intellectual property claims, where there is a real need to preserve the pipeline for future discoveries.

- A recent article in JAMA notes that while the total number of new gene patents has increased from 400 in 1990 to 2,800 in 1999, the universities share of gene patents has grown from 55% to 73%. Before Bayh-Dole, most of this genetics research would likely have been available for free in the public domain.

Expanding intellectual property claims are also leading some universities to clash with their own students and professors over the rights to commercially promising discoveries.

- In perhaps the most remarkable case, the University of South Florida filed suit against a student, Petr Taborsky, who was at work on his master's thesis. Taborsky, who had been working with his professor on a sponsored research project, claims he had received permission from his professor to pursue his own research approach. But after he discovered a commercially promising way to remove ammonia from wastewater, the company and the University laid claim to his work. The university, in fact, spent ten times the original research grant on legal fees alone. Taborsky was eventually convicted of stealing university property and, under Florida law, was sent to a maximum security prison! The case rapidly turned into an embarrassing media spectacle, however, leading governor Lawton Chiles to intervene and offer Taborsky clemency, which Taborsky on principle refused.

Much to their dismay, universities have also discovered that defending their intellectual property is costly! The truth about Bayh-Dole, which no one wants to discuss, is that very few schools are actually making any money off of all this licensing activity. And, in looking at figures from the Association of University Technology Managers (AUTM), we see that a large number of schools actually spent more on legal fees—to defend their intellectual property—than they brought in from royalties.

However, the difficulty in turning a profit seems only to have made some schools more aggressive. Stanford University, for example, has gotten into launching its own brands (to extend the life of its royalty income beyond the life of a patent); other schools are spinning off for-profit subsidiaries, such as online-education ventures.

One third, and final danger looms if universities do not retain their autonomy from the market: Namely, that the university's own research agenda—and its curriculum—will become increasingly tied to the needs of industry.

At U.C. Berkeley, many of the students and professors I interviewed expressed concerns that less commercially-oriented fields of research will languish as the university tightens relations with industry.

One Associate Dean, who shares these concerns, pointed out that in the past decade Berkeley's world-renowned Division of Biological Control, as well as the entomology and plant pathology departments, have been downsized—or outright eliminated—while money has been poured into molecular biology and other more lucrative areas of science.

We must ask what impact this will have on our nation's research:

- The Division of Biological Controlled played a leading role in pest control in third world countries, saving crops that are a food staple for millions of people.
- And although these ecological and organismic areas of science are not patentable, they have provided enormous public benefit.

At Stanford University, I interviewed several experts on university-industry alliances who noted that universities have historically played an essential role in the public health field as well. The pharmaceutical industry has never been interested in sponsoring research on any number of serious Third World diseases or vaccines, they pointed out, because developing nations cannot afford to pay high prices for drugs. This is the kind of research that universities are uniquely capable of performing, when they are not driven by commercial forces.

So what is really at stake here? In a recent speech entitled "The Privatization of Public Universities," Robert Berdahl, the Chancellor of U.C. Berkeley, asked whether, as the research agendas of universities and industry blur, "there will be any significant investment in research that is simply in the public interest, rather than the private interest."

Berdahl, by the way, was a defender of the Novartis agreement and believes great benefits can come from university-industry collaborations. But he also fears that market values will increasingly dictate what types of inquiry the university undertakes.

This trend poses a particular threat to the humanities, where research very rarely, if ever, has direct commercial value. As Chancellor Berdahl noted in his speech, "With the new capacity of some faculty—biologists, engineers, computer scientists, and business school faculty—to earn substantial amounts outside the university, there can be a corresponding devaluation of the work of humanists and social scientists." It is worrisome, Berdahl continued, "that the great challenges posed by the advent of the new technologies... are fundamentally issues of ethics and public policy. Who will guide us through the moral and policy thicket of this new age if the humanists and social scientists are weakened by the overwhelming drive of market forces in a university-industrial complex?"

Berdahl is not the only one concerned about this. In a two-year national study published in the Harvard alumni magazine, two scholars, James Engell and Anthony Dangerfield, found that from 1970-1994 the number of bachelor degrees conferred in English, foreign languages, philosophy and religion all declined while there was a five-to-ten fold increase in computer and information sciences. Engell and Dangerfield trace this to what they term the new "Market-Model University," in which subjects that make money, study money or attract money are given priority.

One school that I visited for my *Atlantic* article was George Mason University, which recently decided to boost funding in areas like computers, information technology, and biotechnology. At the same time, degree programs in classics, German, Russian, and several other humanities departments have all been eliminated. The university's president defended the cuts by saying that "funders take a dim view of giving you money to run an inefficient organization." He notes that students are "good consumers" and they want degrees in areas where there are robust job opportunities.

Of course, universities do need to prepare students for the job market. But at George Mason, hundreds of professors and students signed a letter of protest, arguing that that these cuts would undermine the university's ability to provide a well-rounded education. Higher education, they argued, means more than training students job skills—it means teaching them to read, write and think critically, to reflect on the world's problems and to obtain a broad knowledge of various subjects. It means, in short, creating intelligent, well-rounded citizens.

More broadly there is the question of how much money universities are dedicating to teaching versus how much is going into research.

- From 1976 to 1994 spending on instruction declined by 9.5% at public universities while spending on research increased by 21%

- Over this same period, the number of full-time faculty declined, while the use part-time faculty more than doubled.

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In my concluding remarks, I would like to address the most important question of all: What do we do about all of this?

Am I proposing that we simply turn back the clock and cut off all ties between industry and universities?

The answer, I believe, is No. Erecting an impenetrable wall between universities and the commercial sector would neither be wise or realistic. But I do believe that quite a lot can and does need to be done:

First and most importantly, I think the nation's universities should band together and establish collective guidelines that would preserve academic freedom in all their interactions with industry. The reason these guidelines must be collective is that, otherwise, we risk creating a race to the bottom. When one school adopts a more stringent policy on equity holdings, for example, you can't have accomplished scientists and professors running to other schools with more lenient policies.

Unfortunately, universities have not taken kindly to this idea of a collective response. In January, when the Dept. of Health and Human Services issued "draft" interim guidelines on financial conflicts in clinical research, and opened them up for public comment, leading education organizations—like the American Association of Medical Colleges, the Association of American Universities, and the Nat'l Assoc of State Universities and Land Grant Colleges—all wrote the HHS requesting that the guidance simply be "withdrawn." Rather than offering constructive criticism and working through the government framework, they were adamant that they should be left to develop their own policies.

But, thus far, universities have been very unsuccessful in developing conflict of interest policies to address the problems I have laid out. In a recent study published in the JAMA, which examined the conflict of interest policies at 100 universities, researchers found little uniformity, and a remarkable absence of safeguards:

- Only 55% of policies required disclosures of conflicts-of-interest from all faculty.
- Only 19% of specified any limits on researchers' financial ties—such as equity—to companies sponsoring their work.
- Only 12% specified limits on delays in publication.

It is my view that universities need to do better. Here are my recommendations:

1) In line with federal guidelines, all universities should prohibit publication delays of more than 30-60 days, and any other editorial constraints imposed by corporate sponsors, such as pre-publication revisions.

2) Colleges and universities should require professors to publicly disclose all of the entities that are funding their research (as well as all related financial ties such as equity, consultant fees etc.) on all publications, and they should maintain a publicly-accessible database where any one can look up a professor's funding sources and other financial ties.

3) Dr. Marcia Angell, the former editor of the New England Journal of Medicine, recently pointed out in testimony before the NIH, that institutions must also go beyond mere disclosure and must adopt policies that actually prevent professors from having direct financial ties to companies sponsoring their work. I agree, and would recommend that investigators who receive grant support from industry should not be permitted to have any other financial ties to those companies (including stocks, seats on boards etc.) These kinds of interests are not acceptable in the journalism or legal profession, why should it be any different in academia?

4) Institutional conflicts are an equally serious problem. I would recommend that universities, themselves, be banned from investing in companies sponsoring their professors' work, as well as other start-up companies founded by their professors.

5) Also, universities should mandate that their technology licensing offices always work to minimize proprietary restrictions on basic research tools and reagents so the basic building blocks of science continue to be shared.

6) Finally, and most importantly, universities should refuse to tailor either the research agenda or the curriculum to the needs of industry,

and make a stronger case for the importance of preserving public support for higher education.

In closing, I would like to stress that even on utilitarian and economic grounds, there is strong evidence to suggest that it would be foolish for universities to allow the research agenda or the curriculum to become commercially driven.

In the spring of 1999, I met with Dr. Paul Berg, a Nobel Prize winning biochemist at Stanford, who was a seminal figure in the biotech revolution, having laid the early groundwork for splicing DNA to make hybrid molecules. Berg points out that, in its early stages, all of the basic research that led to the biotech revolution was funded not by industry but by the government. Why? Because it did not appear to have any commercial promise, so industry and the venture capitalists simply were not interested in funding it.

Berg stresses that many of the most important scientific breakthroughs—including the computer-engineering revolution—resulted from public support of basic, undirected research that yielded unexpected discoveries, some of them with great commercial benefit.

So, if we allow universities to become too closely enmeshed with the marketplace, I think there is a grave risk not only to the humanities and to "public good" research and to the integrity of the scientific enterprise, but to our economy and to our future economic growth.

The University's independence from the marketplace, in short, should not be thrown away lightly.

Thank you very much. I look forward to a lively discussion in the question and answer period.