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Improving University Technology Transfer and Commercialization

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EXECUTIVE SUMMARY

According to the 2010 Association of University Technology Managers Licensing Activity Survey, faculty researchers created 595 companies in fiscal year 2008. During this time, over 5,000 licenses and options were executed, and 648 new commercial products were taken to market. University-based personnel filed over 12,000 U.S. patents, and 3,280 of these actually were approved. Federally-funded research activities at universities generated about $2.5 billion in licensing fees for institutions of higher education.

Reuters

Despite the seeming magnitude of these numbers, the figures mask several important problems. The federal government invests $147 billion in U.S. research and development, with $90 billion going to institutions of higher learning to underwrite faculty research projects and the training of graduate students and post-doctoral fellows. However, based on licensing fees, federal dollars generate a very small rate of return on investment. Given the billions in government money invested in higher education research, there should be a higher yield than that for universities.

Part of the problem is that the focus on patents, licenses, and startups places too much emphasis on outputs as opposed to outcomes. Those indicators represent proxy measures of getting material to the market as opposed to whether particular research ideas actually are having an impact and being successful in the marketplace. If a patent is awarded, a license issued, or a start-up business established, it does not

guarantee that the product is used or generates revenue.

In judging performance, most current university reporting approaches are inadequate for determining the efficiency and optimum use of research investments (Gilburne, 2010; Holly, undated). There is no way through tabulations of patents and startups to measure money in versus money out on university research investments. Public and private donors invest considerable funding in support of faculty work, and backers need better information to determine whether universities are making the most effective use of external resources or whether new models would produce better results. With improved metrics, it would be possible to envision alternative approaches or different personnel configurations and resource allocations.

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This paper reviews how universities report their commercialization activities, the need for better performance metrics, and ways to improve their disclosures and overall performance. Using an analysis of technology transfer annual reports, I argue that universities should provide more detailed financial performance data. By offering more complete material on money in and out, it would help evaluate how well universities are commercializing their research ideas and whether alternative models would produce better results. There needs to be better understanding of the innovation differences across academic fields, and increased emphasis on university transparency, accountability, and overall performance. I close the report by making specific recommendations for ways to do better on technology transfer and commercialization.

Current University Reporting Practices

In their annual technology licensing reports, I found that most universities report on six common performance metrics. The typical approach to measurement emphasizes outputs such as numbers of invention disclosures, patents applied for and won, business licenses, company startups, and overall revenue generated. The reason behind this approach is quite clear. Patents and licenses are a necessary condition for market success, and therefore represent key indicators of long-term effectiveness. They are easy to count and straight-forward to track over time.

The table below reports the information contained in online technology licensing office annual reports at a number of leading universities. The schools are ranked in this chart by program revenue and range from a high of $86 million for the University of Wisconsin to $4.4 million for the University of Colorado. There are wide variations based on the particular metric. For example, MIT (N=530), Stanford (N=443), and University of California at San Diego (N=373) perform well on invention disclosures, while the University of Washington (N=220) and Cornell (N=114) do well on license agreements. Johns Hopkins (N=579) and Cornell (N=420) perform at the top in terms of number of patent applications. Yet MIT (N=166) and Cornell (N=140) represent top performers on patents actually issued.

University	Invention Disclosures	Patent Applications	Patents Issued	License Agreements	Startups	Program Revenue in Millions
Wisconsin (2010)	350	200	130	61	2	$86.0
Princeton (2009)	77	107	38	33	N/A	$65.6
Stanford (2009)	443	N/A	N/A	77	9	$65.1
MIT (2010)	530	184	166	57	16	$60.1
Washington (2009)	349	262	40	220	10	$50.4
Cornell (2010)	338	420	140	114	N/A	$31.9
UCLA (2009)	333	179	60	37	N/A	$28.9
UC San Diego (2009)	373	286	64	85	9	$26.3
Michigan (2009)	350	151	72	78	8	$18.3
Johns Hopkins (2009)	352	579	46	99	10	$16.2
Harvard (2010)	301	133	38	37	7	$10.1
Wash U. (2009)	125	106	50	44	2	$7.9
Pittsburgh (2010)	225	69	33	54	N/A	$6.1
Colorado (2009)	258	204	24	61	11	$4.4
Source: University Technology Licensing Office Annual Reports						

There are some exceptions in the metrics reported. Princeton, UCLA, Pittsburgh, and Cornell publicize data on five of the six metrics, but not information on number of business startups. And in its online report, Stanford has data on invention disclosures, license agreements, startups, and program revenue, but not patents filed or issued.

One has to be careful in comparing universities because there are inconsistencies in how terms are defined and numbers can change from year-to-year. For program income, some places include income based on royalties, upfront licensing fees, and software licenses, while others report equity sales and distributions, maintenance fees, and/or legal settlements. With patents filed, many universities limit the number reported to the particular year under consideration, while others include the total over a period of time.

Even more confusing is the fact that many places enumerate patents filed in the United States, while other institutions include patents filed either in the U.S. or abroad. If the goal is to compare university performance, the lack of uniform reporting standards and definitions makes it difficult to evaluate school performance

or determine what approaches work best.

There are variations in the timeliness of reporting by some universities. For example, when we were compiling data in 2011, Princeton, University of California at San Diego, Johns Hopkins, and the University of Washington had fiscal year 2009 data on their technology office website, while Pittsburgh, Washington University, Harvard, and Cornell already had uploaded reports based on fiscal year 2010. More timely and regular updates would be helpful to outside constituencies seeking information on university activities.

The Need for Better Metrics on Technology Transfer

The problem with common reporting approaches is that they ignore outcomes and more nuanced performance measures. University officials and financial backers require detailed information on revenues generated versus investments made and financial rate of return. By focusing on the outputs of technology transfer, but not the manner in which these ends are reached or the ultimate impact of the investment, it is difficult to judge institutional performance or compare policy approaches. With available information, investors and donors don't know how much universities are spending to produce these kinds of outputs, whether investments are taking place in the most effective manner, and whether alternative business models would produce better results.

It is important to distinguish different types of expenditures and revenues. For example, universities often count licensing money sent back to departments as an expenditure because it represents an out-flow from technology licensing offices. However, since the money goes to support faculty research in departments, it actually is a vital source of income for instructional programs.

There are several reasons why more detailed data would be helpful in regard to university technology transfer. Most metrics don't reveal how well institutions of higher learning are doing in regard to research transfer and spinoffs. By comparing how much money is coming in versus going out, and what kind of university infrastructure is necessary to support transfer activities, better metrics would provide clearer incentives for university faculty and improve people's understanding of research efforts.

Universities put considerable financial resources, facilities, and staff time into research. Science labs, for example, can cost $100 million or more in construction charges. Between personnel and office expenditures, technology transfer offices can run several million dollars each year. In 2008, for example, these offices employed 2,092 full time equivalent employees, or an average of 11 per office (Association of University Technology Managers Survey, 2010, p. 19). With those kinds of large outlays, it is crucial to know the relative balance of research costs and benefits.

Educational institutions draw funding from students, parents, alumni, state and

federal taxpayers, individual donors, foundations, and companies (Belenzon and Schankerman, 2009). According to the 2008 Association of University Technology Managers licensing activity report, schools included in the survey garnered $32.7 billion in federally-sponsored research that year and $3.73 billion in industry-sponsored research (AUTM Survey, 2010, p. 10). Through the Department of Defense and the Defense Advanced Research Projects Agency, the U.S. military also devotes several billion dollars annually in support of university-based research.

Greater transparency would improve the knowledge level of external constituents and provide information internally that is relevant for new models of technology transfer. Data can demonstrate whether old models are working and the possible impact of new ways of transferring knowledge. What levers of change would be most effective at achieving good results and are there ways to repurpose money currently being invested in technology transfer? By answering these questions, university administrators would be in a stronger position to promote technology transfer.

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The Importance of Money In and Out

In looking at technology transfer reports, most schools report little data on money in and out. Too often, information is overly aggregated so it is impossible to compare performance or judge whether investments in particular fields are yielding results or whether alternative models would produce a higher rate of return. Universities need to distinguish different types of expenditures in terms of whether they advance or detract from the university mission.

There are some schools that provide information that is helpful to outside investors seeking more detailed material. For example, the University of California at San Diego represents a school with relatively detailed reporting. Its 2009 technology licensing office report showed an income of $27.1 million, comprised of $22.2 million in inventions, $4.4 million in legal cost reimbursement, and the remainder in copyright, tangible research materials, or extraordinary income defined as legal settlements or one-time payments. Its expenses totaled $12.0 million and included $6.3 in patent litigation, $3.1 million in office expenses such as salaries, benefits, and program activities, and $2.6 million for the University of California General Fund.

This information helps outsiders evaluate how well the institution is doing and how it is raising and spending money on technology commercialization. In particular, it presents relevant spending breakdowns and the amount of money sent back to the university in support of other activities.

Another example comes from Washington University in St. Louis. It showed $7.9 million in income, $7.6 million in expenses, and a net surplus of $255,000 in 2009. Of its income, $6.3 million came from license fees and $1.6 million derived from expense

reimbursements. The biggest category of expenses was based on inventor distributions ($2.6 million), school distributions ($2.5 million), and legal fees ($2.2 million). This means that its technology transfer activities generated $5.1 million that was used to support faculty work and school programming.

Similarly, Cornell University reports $31.9 million in revenue, $11.0 million in expenses, and $11.1 million in mandatory distributions during FY10. Of its revenue, $9 million comes in licensing fees, $2.7 million in patent expense reimbursements, $20.1 million in extraordinary income related to equity sales and litigation settlements. For its expenditures, $6.2 million came in legal fees, $4.1 million in office operations, and $0.7 million in extraordinary expenditures linked to litigation.

The University of Colorado's annual report shows that its technology transfer office had overall expenses of $4,098,320 in fiscal year 2010 with three-quarters of the spending coming from salaries and benefits ($2.1 million) and one-quarter coming from legal fees and patent costs (nearly $1.2 million). There were no reported distributions back to support faculty activities.

But most schools do not provide sufficient detail for even these types of rudimentary comparisons. University observers need information on legal fees, equity investments, and various kinds of expenditures. Without that material, it is impossible to judge how universities are doing.

The Complexity of Legal Fees

It is helpful when schools include details on how much is spent on court cases, how much of these expenses have been reimbursed due to favorable court rulings, and the impact of litigation on program revenue. These data are important because legal fees represent a major factor in the overall performance of certain institutions. Sometimes, legal costs comprise one-third to one-half of the total budget of technology transfer offices. Johns Hopkins University compiles detailed data on legal proceedings and its report shows that $6.5 million was spent on legal fees in an office that reported $12.2 million in total revenue.

A key indicator in technology licensing office performance is the ability to recoup legal fees. At Colorado, for instance, the ratio of legal fee reimbursements to expenditures is 70 percent, meaning that it won reimbursement of more than two-thirds of its legal costs. At the University of Washington, the reimbursement rate is 60 percent. With the high rate of spending on legal fees to defend or promote patents and licenses, the ability to recoup legal fees is crucial to determining the cost/benefit ratio for universities.

The Need for Better Information on Equity Investments

Another area in need of more detailed reporting is equity investments. Few

places provide much information on percentage of shares owned, estimated valuations, annual realized or unrealized gains, or yearly performance. As an example, Cornell University explicitly states that it "holds private equity in 25 companies with licensed Cornell technology, the value of which cannot be reliably estimated at this time." Although it is difficult to develop valuations for privately-held companies, it is not impossible. Venture capitalists and private equity firms place value on these kinds of properties on a regular basis. They base judgments on the business costs at the time of initial investment and how subsequent events linked to revenue, market trends, and long-term potential have raised or lowered valuations. Some sense of realized and unrealized gains based on generally accepted accounting principles (GAAP) are necessary for investors and financial managers to determine how equity investments are performing.

The Need for Technology Transfer Breakdowns by Academic Field

Many schools do not explain which divisions of the university are supplying patents or licensing revenue. The mix of inventions matters because university costs and benefits vary considerably based on the distribution of patents by particular areas of study. Biomedicine is very different in the dynamics of innovation from engineering, physical sciences, material sciences, or computer science. In the former, patents are very important to the invention or development of drugs, genetic markers, or medical devices. In the latter, patents are less crucial and more attention is focused on copyrights and the startups and licensing agreements that commercialize new products or services.

There are some schools that do provide more detailed information by academic field. The University of Washington provides invention disclosures by field of study. Of its 349 disclosures for FY09, 151 came from engineering, 128 from medicine, 31 from arts and sciences, 23 from oceans and fisheries, 2 respectively from dentistry, forest resources, information, and public health, and 7 from other areas. Its report furthermore breaks down patents filed and awarded by academic discipline. This is the type of information that is helpful in facilitating more in-depth analysis.

At the University of Michigan, its annual report breaks down invention disclosures by academic division. It shows that most of its inventions come from engineering (a total of 158, or 45 percent) or medicine (a total of 131, or 37 percent). The rest of the university produces only 61 disclosures (18 percent).

Whether a university has a large medical school has major consequences for its innovation footprint and resource investments. For Washington University in St. Louis, most of its 106 patent applications in FY09 came from its school of medicine (a total of 82 patents), compared to 20 for engineering and 4 in arts and sciences. In terms of its 44 license agreements, 41 came medicine, while 2 came from engineering and 1 from social work. Of its overall FY09 total of $7.9 million in license revenue,

$6.4 million came from medicine, $1.1 was based on engineering, and $0.4 million arose from arts and sciences.

The same was true for Johns Hopkins University. Its report shows the distribution of invention disclosures by academic discipline. Of the 352 disclosures for FY09, 265 came from the school of medicine, 41 from engineering, 20 from arts and sciences, 18 from public health, and 8 from other places around the university.

[I]nstitutions need to document the specifics of legal expenses, legal fee reimbursement ratios, equity investments, patent citations, innovation types, and revenue sources because this is the information that provides for more nuanced judgments about university operations.

Paucity of Data on Investment Mix

Virtually no institution of higher education provides breakdowns on whether royalties come from a few big winners or many smaller successes. This information is essential to judging the volatility of program revenue and its dependence on a few strong performers. For some schools, the bulk of their royalty income may come from a single blockbuster drug patent or licensing agreement.

At the University of Colorado, for example, its technology licensing report noted that revenues dropped in recent years due to the expiration of a key patent and completion of a particular royalty stream. Princeton noted that its excellent performance on program income in 2009 was due in substantial part to royalty income based on sales of Alimta, an anti-cancer drug licensed to Eli Lilly. And Stanford indicated that $38 million of its gross royalty income came from one license. The strong showing of a few particular inventions may mask weak performance in the remainder of the portfolio.

Recommendations for Improving Performance and Reporting

From this analysis, it is clear that university reporting about technology transfer and commercialization needs to provide more detailed financial and performance information and to think about the incentives its metrics provide to university administrators and faculty researchers (Siegel, Waldman, and Link, 2003; Litan and Mitchell, 2010). Many technology licensing offices do not provide adequate information to gauge their performance and this makes it impossible to judge their initiatives. Metrics focused on patents, licenses, and startups means academic officials will emphasize those activities in their own activities, and may not see the bigger picture of technology transfer.

Universities should publicize information on "money in versus money out" and citations to patents as a way to measure promulgation. In particular, institutions need to document the specifics of legal expenses, legal fee reimbursement ratios, equity investments, patent citations, innovation types, and revenue sources because this is the information that provides for more nuanced judgments about university operations. Without that kind of material, it is impossible to evaluate current operations or envision alternative ways of handling innovation or repurposing

financial investments.

In the following section, I suggest several policy, operational, and reporting changes designed to promote better university performance, transparency, and accountability in technology transfer. These improvements would make a big difference for universities by focusing their attention on outcomes as well as outputs.

Better Information

Every major university has a technology licensing office website that details policies, disclosure procedures, and staff contact information. However, the bulk of educational sites focus much more on providing material to researchers within the university and outside investors. With a few exceptions, many of them provide little useful information to external audiences regarding how the university is doing at technology transfer and commercialization. Even a simple matter like finding the university's annual licensing report is difficult because many annual reports are buried on licensing office websites and not easy to access. This makes it difficult to locate data on university licensing activities.

Of course, not every bit of information needs to be shared with every audience. Some constituents need more detailed information than others. Donors, financial supporters, and the board of trustees deserve nuanced information on individual programs and financial performance. In order to invest money, they need to be confident about how the institution is spending money.

More Accountability

In the corporate sector, publicly traded companies are required to release detailed "10-Q" and "10-K" disclosure forms on a quarterly and annual basis, and "8-K" reports on specific events affecting the business. These documents lay out detailed information on revenue, expenditures, valuations, business conditions, investment decisions, and financial risks. Companies are required to provide a copy to the Securities and Exchange Commission and any shareholder who requests a copy. In practice, many firms now place these documents on their website in order to provide around-the-clock access to anyone interested in the firm's finances, regardless of whether they are a shareholder or not. By having specific data on current and future conditions likely to affect business fortunes, it helps shareholders, employees, reporters, policymakers, and the general public know what is happening inside the company.

Equity Investments

Universities should consider profiting from inventions not just through royalties and licensing fees but equity stakes in new companies (Darlin, 2011). Right now,

most places focus on short-term revenue and are more interested in gaining $100,000 in immediate revenue as opposed to a 5 percent equity stake that may generate billions down the road. This eliminates opportunities to hit the real homeruns and to gain revenues that would result from the faculty inventions having the greatest social and economic impact.

When they take on equity investments, though, institutions of higher learning need to offer more detailed material on equity investments. This includes information such as percentage of shares owned, estimated valuations, annual realized or unrealized gains, and yearly performance. This will allow universities to calculate realized and unrealized gains as well as overall performance of these holdings.

In some cases, universities would profit from taking equity stakes in new startups, as opposed to relying only on royalties and licensing fees. Right now, technology licensing offices place more value on short- than long-term revenue. This reduces their opportunities for major investment successes and prevents them from gaining revenues that would result from the faculty inventions having the greatest social and economic impact.

Standardized Reporting Forms

Universities should develop best practices reporting forms that include detailed information on income, expenses, and the innovation portfolio. On the income side, they should note royalties, licensing fees, legal settlements, legal fee reimbursements, equity investments with gains realized and unrealized, equity sales, university loans, extraordinary income, and general fund investments. In terms of expenses, they should detail salaries and benefits, rent, overhead, legal fees, mandatory disbursements, and program outlays. For the overall invention profile, they should note sources of innovation based on school, division, and department at the institution, by both numbers of inventions as well as the amount of revenue that is generated.

Do More to Encourage University Innovation

In order to expedite innovation, some universities have developed "proof-of-concept centers" that provide funding and commercialization expertise to early-stage innovators so that they can get advice on promising inventions (Allen, 2010). The notion behind this idea is that if faculty members receive feedback early in the invention process, it will reduce later delays.

Express licenses have been proposed by which universities employ standard licensing agreements for routine inventions (Mitchell, 2010). Rather than undertaking independent reviews of each new idea and developing unique agreements for that particular product, universities can cut the time to development by streamlining licensing approval.

Still another idea is to provide faculty members with commercialization mentoring and coaching (Phan and Siegel, 2006). The thought is that with improved guidance on how to file patents, license ideas, and attract needed capital, it would speed up the innovation cycle and reduce the time required for commercialization. Most scientists lack experience on business formation, investment plans, capital attraction, and marketing. Providing help on each of those fronts is thought to expedite commercialization activities.

Innovation prizes, incentive pay, faculty bonuses, and seed funding have been proposed that reward outstanding ideas. The view is that universities (or foundations) can create monetary award prizes that go to the best idea(s). This would give inventors and institutions of higher education financial incentives beyond the market value of their ideas to commercialize their discoveries.

Belenzon and Schankerman (2009), for example, found that incentive pay for technology licensing officials was associated with a 30 to 40 percent improvement in average university licensing fees. They found that private universities were more likely to adopt incentive pay than public universities and that government licensing constraints reduced the creation of start-up firms and the amount of licensing revenue.

However, most leading universities do little of these activities. I collected data on current practices at top 20 universities, and the most common initiatives were entrepreneurship centers (100 percent), funding for seed grants (70 percent), and mentoring help (55 percent). Relatively uncommon are faculty choice programs (0 percent), express licenses (10 percent), incubation centers (10 percent), innovation prizes (15 percent), or proof of concept centers (20 percent).

An alternative model would be to hire individuals from financial backgrounds who are skilled at judging market potential and to compensate them not just through salary but with bonuses or commission schedules linked to actual performance.

Improved Compensation for Chief Technology Officers

Chief technology officers often are recruited from the faculty and compensated as academic administrators as opposed to financial investors. Salaries are not commensurate with the level of responsibility they hold and the ability to generate revenue. An alternative model would be to hire individuals from financial backgrounds who are skilled at judging market potential and to compensate them not just through salary but with bonuses or commission schedules linked to actual performance. Universities would generate more revenue if they recruited and compensated licensing officers in ways that encouraged and rewarded entrepreneurship.

Encourage Faculty Mentoring and Coaching

Universities should provide help to faculty members and students on how to market products, incorporate companies, and attract venture capital. Many inventors have little background in commercializing their ideas and building businesses. Even

if they wanted to spin off a business, they would not be sure how to do so. It would be helpful to them if schools offered "how to" advice on technology transfer and what is involved in putting together prototypes of their ideas.

Better Understanding of Innovation across Academic Fields

Universities should understand that the dynamics of innovation vary considerably across academic disciplines. Much of the current university regime on technology transfer focuses on biomedical innovation and the patents that are central to their operations. This is problematic because engineering and software innovation has other kinds of metrics linked to copyright, startups, licensing agreements, and the marketing of new products or services.

The way universities account for innovation should be tailored to each area. Key differences between the life sciences and engineering and computer science must be incorporated in reporting practices, and there should be sufficient detail so that outsiders can understand the dynamics of innovation in each area.

Depending on the strength of various divisions, universities may need to adjust the range of skills in their technology transfer offices. For example, if they have strong engineering or computer science departments, they may need more licensing than patent personnel. There also are different capital requirements for software as opposed to life sciences startups. Universities must incorporate these kinds of innovation differences in their overall policies and resource allocations.

From university licensing reports, it is clear that few institutions are generating much revenue from the social sciences or humanities. In most places, these divisions generate less than 20 percent of the overall inventions and revenue. With renewed attention to education technology, electronic medical records, smart energy grids, knowledge management, computerized language instructions, and technology applications in the humanities, universities should expand their efforts at technology transfer in the social sciences and humanities. These divisions are relatively untapped from an innovation standpoint even though faculty members in those areas are producing new ideas with considerable promise in the marketplace. Universities should redouble their efforts to encourage technology transfer in the social sciences and humanities.

Greater Transparency in Federal Grant-Supported Commercialization

Federal taxpayers have a strong interest in evaluating the impact and effectiveness of that support. In an era of massive government budget deficits, policymakers must examine every expenditure and decide how to make most effective use of federal money. They have a very strong interest in data that will help them make those kinds of judgments.

There should be greater transparency on federally-funded grant activities in terms of how faculty members commercialize their products (Mitchell, 2010). Grant-giving agencies such as the National Science Foundation, National Institutes of Health, the Department of Defense, and the Department of Energy require little reporting on the commercialization of federally-funded activities (Allen, 2010). Successful applicants should indicate what they have done to take their services and products to market. These kinds of reporting requirements would encourage faculty members, post-doctoral fellows, and graduate students to think in a more entrepreneurial manner about their inventions.

There is insufficient data to compare money in and out, and evaluate whether current personnel and resource allocations are appropriately configured.

Currently, the private organization that has done the most to promote commercialization reporting is the Association of University Technology Managers (2008, 2010). Its biannual surveys have done a lot to promote greater consistency in reporting across institutions, and better transparency and accountability among technology licensing offices. Its information on invention disclosures, patents, revenue, expenditures, and salary data is invaluable to technology officials.

But these surveys are no substitute for how universities publicize their activities on their own websites or what funding agencies need from researchers. In some cases, what they document for their trade association is more detailed than what is included in official university reports. Since school officials are compiling information for industry distribution, they should make more of this material available to the general public.

More Information on Geographic Impact

Universities should compile information that demonstrates the geographic impact of their inventions. Many institutions of higher learning have a profound impact on innovation across the country and around the world (Arthur, 2010). For example, the University of California at San Diego has broken down its licensing reports by city, state, and country in order to show the local, national, and international impact of its innovation activities. Overall, its report documents that the university has 202 licenses in California, 157 in other American states, and 51 outside the United States. This is a terrific way to demonstrate impact and build public support for university innovation initiatives.

Conclusion

In summary, we argue that universities need to do more to improve the commercialization of faculty and student research (Rand Corporation, 2003). They should disclose more performance metrics on technology transfer and let the public know more what they are doing. With universities earning only around $2.5 billion in licensing fees from a federal investment of $90 billion, they should consider policy and operational changes that would improve their disclosure and rate of return on

research and development.

Under current reporting approaches, it is hard to compare performance or judge whether universities could be doing better with an alternative approach. There is insufficient data to compare money in and out, and evaluate whether current personnel and resource allocations are appropriately configured. The decision on whether institutions should have fewer patent processors or more attorneys depends on the composition of their innovation portfolio and which departments are providing the biggest bang for the buck. In some cases, it may make sense to target financial resources in more particular ways as opposed to spreading resources thinly across the institution.

College presidents can play a constructive role in encouraging transparency and accountability. They should review university operations with an eye towards improving reporting requirements and removing institutional roadblocks toward better performance. Shedding more light on university activities will help them do a better job on commercializing university inventions and earning additional money for their schools. Only then will people know whether universities are spending money in the right ways.

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