ISSN 1822-8011 (print)
ISSN 1822-8038 (online)
INTELEKTINĖ EKONOMIKA
INTELLECTUAL ECONOMICS
2011, No. 1(9), p. 65–84

INTELLECTUAL PROPERTY RIGHTS WITHIN THE UNIVERSITY: THE LITHUANIAN AND US EXAMPLES

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Abstract. The article revises the intellectual property rights within the university, from the perspective of facilitating and commercializing faculty creativity. The objective of the article is to critically asses the state of the US and Lithuanian policies for the intellectual property rights within the university, and producing of proposals for the adjustment of the technology transfer model and increasing the efficiency thereof. Particular focus is given for the so called university technology transfer office practices by providing a glimpse at their practical effects. The experience of the Arizona State University is assessed and compared to the recent Lithuanian initiatives on the matter. The authors conclude that the technology transfer office model is may have unexpected secondary benefits for the universities, however may need to be adjusted in order to address inefficiencies thereof, which are prohibitive for small universities and countries.

JEL Clasification: K39, O32, O34.
Keywords: intellectual property, technology transfer.
Reikšminiai žodžiai: intelektinė nuosavybė, technologijų perdavimas.

Introduction

While many think of universities primarily in terms of their teaching function – passing established knowledge on to a new generation—most universities also have a second function that is less consciously appreciated by the general public. That second function is to create new knowledge through faculty research. While much

newly created knowledge of course is eventually incorporated into the teaching curriculum, it also serves society more generally by forming the basis for restructuring the social contract through legislation and public policy and for commercial activities that develop university-created knowledge into socially desirable products and services.

The intellectual property system affords to creators of some kinds of new knowledge exclusive rights to certain uses of the new knowledge they have created. In some cases, such as a patent in a popular new drug, those exclusive intellectual property rights (IPRs) can be economically very valuable. If the new creation takes place in the context of employment in a commercial enterprise, such as the development of a new drug by a pharmaceutical company, it is universally true that, either by contract or by operation of law, the IPRs belong to the employing enterprise. In general, such an enterprise will be in the best position to decide whether and how to exploit the creation economically, and the creator was hired to engage in the very activities that led to the creation.

When creative activities take place within the university, however, it is far from clear that university ownership of the related IPRs is the socially optimal way to insure that new knowledge will be efficiently exploited for the good of society. Universities traditionally are not in the business of, nor have any skill in, developing and selling commercial products or services (outside of education). On the other hand, universities always feel pinched for funds and see the possibility of commercial exploitation of faculty creativity as an important potential supplement to their more traditional sources of income—government, student tuition, endowment income, and funded research. If commercializing faculty creativity were costless, it would be difficult to refute the argument that universities deserve to improve their educational mission with the economic fruits of faculty creativity.

The problem is that commercializing faculty creativity is not costless. To overcome the competence problem, many U.S. universities have established technology transfer offices (TTOs), whose mission is to evaluate, patent where warranted, and exploit faculty creativity, through licensing or the creation of new spin off companies. Running such a TTO requires a steady financial outlay, so from a purely economic point of view, the question is whether a given TTO brings in more money than its operations cost. So far, while a few U.S. universities have profited handsomely, the results in general have not been encouraging. Nevertheless universities worldwide have sought to capitalize on the success potential and attempt to replicate the US university TTO approach.

Moreover, assigning the IPRs associated with faculty creativity can make a big difference in whether, and how much, money flows to the bottom line of the university budget. If the university owns the rights but fails to exploit them adequately, or fails to share fairly with the creating faculty member, the result could be less faculty creativity in general and more “under the table” dealings by those faculty members who do come up with commercializable ideas.

This article critically assesses the US and Lithuanian policies for intellectual property rights within the university and offers proposals for adjusting the TTO

model and increasing its efficiency. It employs primarily the comparative analytical method, the interpretative method, and the historical-statistical-analysis method.

This article expands on the general principles outlined above and evaluates some of the empirical studies that have been made on the effectiveness of TTOs at U.S. universities. It offers specific information for Arizona State University (ASU), a large, public U.S. research university whose efforts at commercializing faculty creativity seem so far to have achieved at best modest results, at least when measured by the extra income its TTO supplies to the university. We compare the IPR and revenue sharing rules for ASU with recently adopted regulations for public universities in Lithuania. We also point out an unexpected consequence of the creation of a TTO at ASU: it has created a new opportunity for teaching and training students in the realities of business formation and operation that may justify the net cost of TTO operation, and this is something that should be considered by any university that is considering the establishment of a TTO. Proposals are offered for the TTO model and for increasing the efficiency of TTO operations.

I. Purposes of the IPR System

A. In general

While many think of the sets of exclusive intellectual property rights as a "reward" to the creator for his or her contribution to our knowledge base, in fact the real justification for recognizing IPRs—indeed, the only justification that coherently explains why we have IPRs—is that they are necessary to overcome the public goods problem that would otherwise act as a disincentive to authorship and invention.[1] IPRs are rights in *information*, and information has a fundamentally different character from tangible property (and even intangibles like stocks and bonds): tangible prop-

[1] The economic basis for patent law's focus on technology seems fairly clear. Nothing equivalent to the moral rights of copyright has been seriously proposed for patent law. Copyright, of course, does include the so-called "moral rights" of attribution and integrity, and these non-economic rights are generally nontransferable, even upon transfer of the economic rights (of exclusive reproduction, distribution, etc.). Because most university research with commercial value falls under patent protection, we do not engage the complex discussion of the moral rights of copyright, other than to concede that they do suggest at least some concern with protecting the personality of the author in addition to the author's economic interests, even though not couched in the language of "reward for social contributions. In the United States, the Supreme Court was, until recently, consistent in stating that the fundamental purpose of copyright was to benefit the public, not the author, by providing an incentive to authors to create new works. *E.g.,* Feist Publications, Inc. v. Rural Telephone Service Co., 499 U.S. 340, 349-350 (1991)("The primary objective of copyright is not to reward the labor of authors, but to promote the Progress of Science and useful Arts); Sony Corp. of America v. Universal City Studios, Inc., 464 U.S. 417, 429 (1984)("The monopoly privileges that Congress may authorize are neither unlimited nor primarily designed to provide a special private benefit. Rather, the limited grant is a means by which an important public purpose may be achieved). The 2003 decision upholding the legislation extending the copyright term by 20 years now seems to allow Congress, rather than the courts, to interpret the meaning of this constitutional limitation, but it does not call into question the earlier stated goals of copyright. Eldred v. Ashcroft, 537 U.S. 186 (2003). The Court has made similar statements in the patent context.

erty is a zero-sum-game, in that when one person is using a car or eating an apple (or receiving dividend payments on a share of stock), no one else can use the same car or eat the same apple (or receive the dividends on the same share of stock). On the other hand, information, once created, may be used by many people at once, without diminishing anyone else's use of the same information. Consequently, if we put aside moral entitlements for the moment ("I created it so it belongs to me"),[2] recognizing IPRs in information already in existence is economically inefficient.[3] The owner of the exclusive right can set a price on use of the information, and some uses that would otherwise have been made of it will no longer be viable. The result, therefore, is not merely a wealth transfer from licensees to IPR owners (which has no effect on economic efficiency) but actually reduced use of the information. Consequently, if all creative works of authorship and invention would be made even in the absence of any system of IPRs, it would be economically inefficient to establish such a system.

The creation of information, however, is not costless. A large and sophisticated work, such as a movie or pharmaceutical, requires a significant investment of time, skill, and money. If the result could be freely copied by anyone (that is, if we had no system of IPRs), many authors and inventors would simply devote their time and efforts toward other pursuits, and we would have fewer of the creative information works that society desires. By recognizing IPRs like patents and copyrights, we almost surely have more information available than we would otherwise have. We believe that we get more social and technological progress by recognizing such IPRs than by allowing all knowledge to go into the public domain directly upon creation and publication. For this reason we accept the temporary monopoly represented by IPRs - but that is also why IPRs must expire after a given time (as opposed to rights in tangible property, like land, which are perpetual). A perpetual IPR would not increase the creation incentive by very much, if at all, over the limited terms offered by patent and copyright but would tie up the information in one owner's hands forever.

B. IPRs in the Universities and Public Entities

At the federal level, the U.S. government disavows copyright in works created by government employees in the course of their employment.[4] The theory is that the public should not have to pay twice—once for the employee's salary and again via the copyright monopoly. A similar approach was taken in the U.S. for IPRs arising out of federally funded research, much of which is done at universities. However, many important developments in science and technology are not immediately commercializable, and it was perceived that entrepreneurs were not always willing to undertake the risk of attempting to commercialize a product without a patent in the

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[2] On the question of "natural rights" under copyright, see Dennis S. Karjala, *Federal Preemption of Shrinkwrap and On-Line Licenses*, 22 U. DAYTON L. REV. 511, 514-18 (1997).

[3] See Dennis S. Karjala, *Judicial Oversight of Copyright Legislation*, 35 U.N. KY. L. REV. 253, 269-71(2008);Dennis S. Karjala, *Congestion Externalities and Extended Copyright Protection*, GEORGETOWN L.J. 1065, 1066 (2006).

[4] United States Copyright Act. 105.

underlying invention. Consequently, Congress in 1980 adopted the Bayh-Dole Act,[5] which allows universities to patent inventions created within the university, even if the invention is the product of federally funded research. As a result, many patent applications are now based on university research.[6]

If we assume that universities can own patent rights related to creative research conducted under their auspices, the question is whether the universities themselves or the individual faculty creators should control exploitation of those rights. At the extremes we have two possibilities: 100% ownership by the university with no sharing with the creating faculty member and 100% control by the faculty member with no sharing with the university. Given that the universities pay the salaries and, often, for much or all of the laboratory and work space allocated to the creating faculty member, it does not seem unfair in principle to allocate all control over and benefits from the associated patents to the university. This is generally the case for patents (and copyrights) arising in the commercial workplace. Universities, however, frequently do not have the close supervisory relationship with faculty members that commercial entities have with employees. If the creating faculty member receives nothing, rapid publication is more likely to lead to the kind of recognition in the field that has been the traditional motivator of scholars. Such early publication can ruin the university's chance to obtain a patent, however. There will also be strong incentives on the part of the faculty to try to develop the innovation in secret or at least to give less than full disclosure to the university management. While this may be risky, economic factors alone make it seem likely that at least some attempts in this direction will occur if there is no sharing with faculty at all. This may especially be true where the faculty is underpaid.

On the other hand, if the creating faculty member has sole control over the patent rights and sole right to any proceeds derived from them, the university (or the government) gets no return at all on its "investment" in the faculty member's salary and overhead. Moreover, many faculty members prefer to stay tightly focused on their research programs and are not interested in the often mechanical and legalistic

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[5] Patent and Trademark Act Amendments of 1980, P.L. 96-517, December 12, 1980.

[6] Prior to 1981 fewer than 250 patents were issued to universities annually, whereas 10 years later there were almost 1,600 per year. University of California Office of Technology Transfer, *University Technology Transfer-Questions and Answers*, <http://www.ucop.edu/ott/faculty/tech.html#1>. By 2003 the number was up to nearly 4,000. Bernard Wysocki Jr., College Try: Columbia's Pursuit of Patent Riches Angers Companies, WALL ST. J., Dec. 21, 2004, at A1. One commentator has taken issue with the widespread implication in the literature that the Bayh-Dole Act was the cause of the increased patenting by universities since 1980. David C. Mowery, *The Bayh-Dole Act of 1980 and University-Industry Technology Transfer: A Policy Model for Other Governments?*, <http://www.merid.org/bayh--dole/BDRFpaper_Mowery.pdf>. Professor Mowery concludes, "U.S. universities were active patenters and licensors for decades before 1980, and much of their patenting and licensing activity since 1980 has been concentrated in a few fields, at least some of which also have benefited from rapid growth in public research funding and significant advances in basic science. As a result, Bayh-Dole may have been neither necessary nor sufficient for the subsequent increase in university patenting. Because other countries have different higher education systems, emulation of Bayh-Dole may not produce the desired results, especially in the absence of structural reforms in the national systems of higher education. *Id*. at 23-24.

details of commercializing an innovation. It is obviously an empirical question how to maximize faculty incentives to innovate, but it seems plausible that some sharing of the burdens and the benefits of commercializing inventions will be optimal, even though it is likely impossible to specify precisely how burdens and benefits are best shared.

With respect to copyrights in traditional faculty productions, such as academic articles, textbooks, and class notes, full ownership by the faculty member is almost surely the optimal approach. The contribution of the university (or the government) towards the creation of these items is much less, since they rarely rely on university infrastructure (e.g. lab access or expensive research equipment). It is only the rare, very popular textbook (such as Paul Samuelson's *Economics*) that actually earns enough money to make a difference in university budgets, and the vast majority of traditional faculty works are not capable of economic exploitation at all. Things like class notes and slides generally have value only to the faculty member creating them, as anyone who has ever tried to teach from someone else's class notes can attest. If the university were, as a default matter, to have and retain ownership of copyrights in these materials, the creating faculty member could be hampered in using them, say, upon moving to a position at another institution, notwithstanding that the first university can make essentially no practical use of them. Computer programs may require an approach more similar to patents, because they represent technological innovation notwithstanding that their primary intellectual property protection comes from copyright. As is the case in some European countries, including Lithuania, unless resolved by contracts, the default ownership of right into computer programs would lie with the university (employer), but perhaps should automatically pass back to the employee after a certain period of time (5 years in Lithuania). On-line courses, too, may in the future be marketable outside the university within which they are created, and it may make sense for the university to play some role in, and share in the benefits of, such marketing.

II . Universities and IPRs

In determining the optimal approach to allocating IPRs based on university research, it is important to remain focused on the primary social function of universities. The basic role of the university in society is not to create or market commercial products. Rather, universities exist to create and disseminate knowledge. "Knowledge" here means more than fundamental advances in basic science and developments in applied science and engineering. It also means ideas, thoughts, and analyses in the humanities, such as literature, history, philosophy, music, and art. This knowledge is created by members of university faculties and is disseminated through publication of books and articles, and in the classroom to students, some of whom will carry on the academic traditions in their own careers.

Much creative work goes on inside the university, but most of it is related to teaching or to arcane specialty areas that give it little commercial value. Even very

fundamental work in the sciences may not be eligible for IP protection. This is surely an important rationale for the public funding of universities. If universities had to live on the commercialized fruits of their research, like private companies, they would be very different institutions. Still, to the extent faculty creativity can be turned into money for the university, it could help fund even more and better research and teaching, including research and teaching in fields other than the one in which the commercially valuable advance was made. The extra money from commercialized research can also subsidize general university operations - especially important in times of tight budgets. We should note in addition that getting knowledge usefully implemented for the betterment of society is also a traditional university purpose, whether or not the university makes money.

A heavy focus on commercializable creativity within the university also raises some problems. First, many technology transfer programs actually lose money, leaving even less money available for the traditional university goal of creating and disseminating knowledge. Moreover, those universities that have been fortunate enough to share in the proceeds of a blockbuster patent can become dependent on the income and face withdrawal symptoms when the patent expires. Perhaps a more serious problem is that universities might adopt policies that reward applied science and technology and discourage fundamental research—which would be a change in, and in some ways contrary to, the basic university mission. Universities might seek to delay publication of important discoveries in an effort to insure that any associated patents are as strong as possible.[7] This conflicts at least to some extent with the university goal of disseminating knowledge as rapidly and thoroughly as possible. Universities might also adopt policies that reward science and technology over the humanities, which in the long run can limit the growth of knowledge and culture—again, contrary to the traditional university values. Finally, individual university licensing income does not measure the full social value of university-based innovation, because all IP is "leaky" and can often, at least in part, be appropriated by downstream innovators (for example, by "inventing around" a given patent).[8] This downstream innovation is a socially desirable result of university creativity and, indeed, is one of the traditional justifications for publicly funded university research.[9] No university can appropriate all the social and economic benefits its creation and dissemination of knowledge engenders.[10]

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[7] Anderson, Daim & Lavoie, *Measuring the efficiency of university technology transfer*, 27 TECHNOVATION 306 (2007).

[8] Anderson, Daim & Lavoie, *supra* note 7.

[9] Professor Mowery has emphasized that we would be better off with government acting to stimulate industry investment rather than demanding large royalties for their patents. Heidi Ledford, *IP: Ideas for Purchase?* BERKELEY SCI. REV., Spring 2006, at 36. <http://sciencereview.berkeley.edu/-articles-/issue10/IP.pdf>.

[10] See Brett M. Frischmann & Mark A. Lesley, *Spillovers*, 107 COLUM. L. REV. 257 (2007).

III. The United States Experience

A number of universities have created TTOs to participate in the development or licensing of technologies (technology transfer or TT) and have received significant income therefrom. Other universities are hoping to duplicate these results and are establishing TTOs of their own. In 1980 there were some twenty-five TTOs at US universities—primarily major research institutions like MIT, Columbia, and Stanford. By 1999 there were over 200 university TTOs,[11] and in 2003 about 300 (including research institutions and teaching hospitals).[12] Total annual revenue to U.S. universities from TT has been estimated at $1.5 billion,[13] but a mere 10% of the universities accounted for 42% of the royalty income in 2003.[14] While for the years 1997-2003, the University of California averaged $100 million in income, Stanford, $50 million, MIT, $33 million,[15] the TTOs of most universities in fact make little or no money. For 2004, the average licensing income for all universities was $7 million, but the mean was less than $1 million, which means that a few schools are receiving the bulk of the licensing revenue.[16] The successful TTOs are those with a "blockbuster" patent that produces huge returns, but blockbusters are rare.[17]

A number of studies have been made to discover the factors that are associated with successful TTO operations. Private universities with a medical school appear to have greatest success in net licensing returns, for example, while public universities with no medical school have the least success. Public universities with a medical school and private universities without one seem roughly equal. The incentive of higher royalty shares for faculty members have been associated with higher licensing income and more effective TT, as well as a division of revenues that motivates students and departments in the desired direction.[18] Rates of start-up company formation

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[11] Bhaven N. Sampat & Richard R. Nelson, *The Emergence and Standardization of University Technology Transfer Offices: A Case Study of Institutional Change*, draft paper Prepared for 1999 Conference of the International Society for the New Institutional Economics (ISNIE). September 16-18, 1999. World Bank, Washington, D.C. at p.22 <www.isnie.org/ISNIE99/Papers/nelson.pdf>.

[12] William F. Swiggart, *The U.S. Federal Bayh-Dole Act and The State of University Technology Transfer in 2003* para. 14, <www.swiggartagin.com/articles/Bayh_Dole_act.doc>.

[13] Scott Radway, *The Invention Machine*, 52 HAWAII BUS. 40 (2007). This same source reports that from 1998 to 2005 some 3600 new products based on academic inventions were introduced into the market, averaging roughly 1-1/4 new products per day.

[14] Milken Institute, MIND TO MARKET: A GLOBAL ANALYSIS OF UNIVERSITY BIOTECHNOLOGY TRANSFER AND COMMERCIALIZATION 52 (September 2006)(hereinafter referred to as the Milken Report). The 42% figure was down from 52% in 1996.

[15] Milken Report, *supra* note 14, at 66.

[16] Heidi Ledford, *supra* note 9.

[17] Lori Turk-Bicakci & Steven Brint, *University-Industry Collaboration: Patterns of Growth for Low and Middle-Level Performers*, HIGHER EDUCATION (2005).

[18] Milken Report, *supra* note 14; Stephen Albainy-Jenei, *Trouble With Tech Transfer...Or Expectations?*, PATENT BARISTAS (January 19, 2007); Koenraad Debackere & Reinhilde Veugelers , *The role of academic technology transfer organizations in improving industry science links*, 34 RESEARCH POLICY 321; Joseph Friedman & Jonathan Silberman, *University Technology Transfer: Do Incentives, Management, and Location Matter?*, 28 J. TECH. TRANSFER 17 (2003); Saul Lach & Mark A. Schanker-

have been associated with faculty quality (measured by publications) and expenditures on IP protection.[19] One study concludes that TT remains a "risky venture" for universities that lack good technologies, a well-developed regional infrastructure, and a skilled TT staff.[20] Conversely, a clear university mission in support of TT and an experienced TTO enhance university TT.[21]

U.S. TTOs in 2003 averaged about 10 full-time-equivalent (FTE) employees, roughly double the size in 1996. Moreover, obtaining a single patent usually costs over $100,000.[22] As a very rough rule of thumb, therefore, we might say that the average TTO in the U.S. involves costs on the order of $1 million (say, $500,000-$2,000,000). No one wants to miss a blockbuster, but because they are rare, universities should be realistic about the chances of winning the patent "lottery." Moreover, the time lag between obtaining a valuable patent and income from its commercialization can be long—as much as 10 years for pharmaceutical innovations.[23] To maximize the chances of hitting the blockbuster, universities must be willing to patent even inventions that seem at first glance to be of questionable value. Moreover, they must be willing to invest heavily in marketing, and to wait as much as 10 years before seeing any payout—all the time incurring the operating costs of their TTO. As a result, universities operating a TTO must choose to fall somewhere between two poles: At one extreme, to minimize the chance of missing the blockbuster, they must be willing to invest significant up-front costs for an extended period, during which they patent essentially every patentable innovation their faculties create and actively attempt to market them. At the other, they can try to minimize costs by patenting only what appear to be "sure things" and otherwise staying out of the TT business. To the extent universities approach this second pole, however, their reason for operating a TTO at all can be called into question, because if they are not going after the blockbuster, the statistics show that there is little economic justification for establishing a TTO. The modest returns for most universities has suggested to some researchers that recent emphasis on patenting and licensing should be reconsidered, especially "when attempts to privatize some of the returns of university research appear

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man, *Incentives and Invention in Universities* <http://papers.ssrn.com/sol3/papers.cfm?-abstract_id=1158310>.

[19] Dante Di Gregorio & Scott Shane, *Why do some universities generate more start-ups than others?*, 32 RESEARCH POLICY 209 (2003)(concluding that faculty quality and the ability to take equity in the start-up are key determinants of start-up formation); Andy Lockett & Michael Wright, *Resources, Capabilities, Risk Capital and the Creation of University Spin-out Companies*, 34 RESEARCH POLICY 1043 (2005)(concluding that a faculty-favorable distribution formula, a business-capable TTO, and expenditures on IP protection are positively associated with start-up formation).

[20] Turk-Bikakci, *supra* note 17.

[21] Joseph Friedman & Jonathan Silberman, *supra* note 18.

[22] Stephen Albainy-Jenei, *supra* note 18, 22.

[23] Turk-Bikakci, *supra* note 17; Radway, *supra* note 13. It took nearly 20 years to bring the technology for a heart imaging device from the university laboratory to commercialization by a profit-making company (with a share to the university involved). Mary Vanac, *Case Study in Tech Transfer*, CLEVELAND PLAIN DEALER, May 13, 2007.

to conflict with the traditional public research objectives of fostering basic research and to disseminate knowledge."[24]

IV. The Example of Arizona State University

A. The ABOR Intellectual Property Policy

Arizona State University (ASU) is one of three publicly (state) funded universities in the state of Arizona and by student population is one of the largest universities in the U.S. Ultimate governance authority for all three universities is the Arizona Board of Regents (ABOR). ABOR has established an Intellectual Property Policy[25] for the universities it governs that seeks to encourage commercializable invention, to assist faculty in patenting and commercializing inventions, and to share licensing income fairly. The Policy gives ASU all rights in IP developed in "University-assigned" and "University-assisted" projects.[26] The Policy expressly covers all categories of "legally recognized" IP, including patents, copyrights, trademarks, trade secrets, and data,[27] but it releases to the individual creator all rights in traditional academic publications (scholarly articles, textbooks, course materials), artistic works (music, dance, film), and noncommercial academic software. Online courses are to be reviewed on a case-by-case basis.[28]

The Policy requires each employee/creator of IP to disclose any creations to the appropriate University official. The University then must decide whether to promote the IP or release it to its creator.[29] If the University decides to keep the IP, it pays all the costs of obtaining and maintaining the appropriate protection, including patent filings. Employees are asked to "consider" delaying publication until the IP is fully evaluated by the University, to maintain worldwide patent rights.[30]

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[24] Harun Bulut and GianCarlo Moschini, *U.S. Universities' Net Returns from Patenting and Licensing: A Quantile Regression Analysis*, CENTER FOR AGRICULTURAL AND RURAL DEVELOPMENT (CARD) PUBLICATIONS 06-wp432 (2006), <ideas.repec.org/p/ias/cpaper/06-wp432.html>.

[25] Arizona Board of Regents, POLICY MANUAL, Ch. VI, ¶ 6-908 (most recent amendment June 1999) <http://www.abor.asu.edu/1_the_regents/policymanual/chap6/chap6_part2.htm#6-908>.

[26] "University-assisted projects are those that make "significant use of university resources, and the Policy purports to cover even IP developed by students making such significant use of university resources. Use of office space, library resources, or personal computers is not "significant use; however, "assistance of support staff; use of telecommunication services; use of university central computing resources; use of instructional design or media production services; access to and use of research equipment and facilities, or production facilities purports to be a significant use. ABOR Policy C.2 & C.3.

[27] ABOR Policy B.

[28] ABOR Policy C.4. Student works are excluded but are subject to exceptions that almost swallow the rule: If the student creates the IP in the course of employment with the University, or if the student makes significant use of University resources (which include the computing center), or the student's work is part of a project sponsored by outside funding.

[29] The University retains a royalty-free license to use the IP for education, research, and public service even if it is released back to the creator.

[30] ABOR Policy D7.

The Policy also provides for revenue sharing between the University and the faculty creator. The faculty creator of the IP gets 50% of the first $10,000 in "net income"[31] from the IP and 33-1/3% thereafter. Another third goes to the lab or departmental unit where the creator is employed, and one-third goes to the University.[32]

B. The ASU TTO

The ASU Foundation is a separate legal entity that handles all charitable gifts and contributions to ASU. The Foundation is the sole member (shareholder) of a limited liability company called Arizona Science and Technology Enterprises (AzTE). AzTE was founded in 2003 and operates as the exclusive intellectual property management and technology transfer organization for ASU—in other words, AzTE is the ASU TTO. AzTE has about 16 employees plus a number of student interns—a managing director, a legal team (two), a VP for venture development, a life sciences team (three), and a physical sciences team (three); six people work in operations and finance.[33] AzTE claims a large patent portfolio[34] and that it has supported a number of successful start-up companies in promising new areas of technology.[35]

AzTE has reported revenues averaging about $2.8 million for fiscal years 2004 to 2008, including reimbursements of legal fees.[36] On the other hand, its actual expenses for 2008 were nearly $5.2 million. While this does not tell the full story of the economic value of AzTE to ASU – AzTE plays an active and helpful role in negotiating research funding commitments for the University[37] – these numbers at a minimum support the argument for patience in waiting for a university TTO to bring in revenues that can significantly enhance university operations and programs.

The noneconomic aspects of TTOs also bear careful consideration. We have already discussed the issue of preferencing science and technology over the humanities, as well as applied research over more fundamental research. Universities that focus too single-mindedly on economics in their TTO operations run the risk of losing sight of their core mission to create and disseminate knowledge to society as a whole. There is also a positive potential noneconomic pedagogical aspect of TTOs, in that

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[31] " Net income is gross revenues minus 15% and minus all direct costs of maintaining the IP (e.g. cost o patenting).

[32] ABOR Policy F. The ABOR Policy actually provides for a minimum of 25% to the creator after the first $10,00 in net income, but ASU has adopted an internal policy interpreting the ABOR Policy that increases that to 33-1/3% Arizona State University, RSP 604: Intellectual Property Management Implementation Policy <http://www.asu.edu/aad/manuals/rsp/rsp604.html>.

[33] In contrast, the University of Washington in 2003 employed 45 people it its TTO. Milken Report, *supra* note 14, at 52.

[34] A description is available at the AzTE web site: <http://www.azte.com/page/portfolio>.

[35] <http://www.azte.com/page/startups>.

[36] Executive Summary, Arizona Board of Regents Meeting, Dec. 4-5, 2008, at p.4, <http://209.85.129.132/search?q=cache:B3w5UQqHHLAJ:www.abor.asu.edu/1_the_regents/meetings/board_book 2008-12-Dec/App-30-ASU-2008-12.pdf+azte+2004+revenues&cd=4&hl=en&ct=clnk>.

[37] For 2008, AzTE claims an instrumental role in closing transactions for $8.6 million of research funding and significant time on other research funding agreements totaling $4.8 million. *Id*.

they can provide important practical education and experience to students. This is well exemplified by ASU's Technology Venture Services Group (TVSG).

C. The Technology Venture Services Group

TVSG is comprised of two student clinics: The Technology Ventures Legal Clinic (TVLC), consisting of law students certified to render "pro bono" legal services and supervised by an experienced attorney, and the Technology Ventures Consulting (TVC), consisting of business, science, engineering, and other non-law students as well as interested law students. TVLC and TVC work together to provide services to Arizona entrepreneurs and small businesses as well as TT professionals. TVLC—the legal clinic—assists in such matters as business formation, nondisclosure agreements, patent searches, licensing agreements, trademark and copyright consulting, and employment agreements. TVC—the "business clinic"—assists in technology assessment, market research, ownership structures, strategy formation, implementation plans, and similar activities.

This past year (2008-2009), 35 students participated and assisted 26 clients in technology start-up and commercialization efforts. The annual budget for TVSC is about $200,000, including the salary of the full-time director. TVSG only accepts projects from AzTE, other ASU-related organizations, and community partners (e.g., law firms and companies that contribute money to TVSG). In choosing projects, TVSG looks to potential experience and educational value, relation to ASU and Arizona, financial need, and its own competence.

Thus, for a relatively modest cost, TVSG offers a unique educational experience for students, giving students real-life problems involving real people and real money and supervising them in their search for an optimal solution. TVSG also offers free support for AzTE, reducing that entity's need for expense money while it awaits its blockbuster, and when the students graduate they constitute a pool of specifically trained students from which AzTE can recruit interns or full-time employees. The community partners, too, serve as supporters of innovation in Arizona, have access to a pool of specially trained students, participate in the TVSG referral network, and capture tax advantages from contributing to ASU.

Consequently, even if AzTE never achieves its "blockbuster" patent that brings in large revenues to the University, the educational and community-service side benefit from TVSG is an extremely important aspect of the overall TTO operation at ASU.

V. Comparison to Lithuania

A. Background situation in Lithuania

In terms of goals, Lithuania, like the US, wishes to promote a creative and productive society. Lithuanian universities also share the basic goals of creating and disseminating knowledge. Because much basic research in the sciences today can cost huge amounts of money, a relatively small country like Lithuania may pragmati-

cally choose to focus its university creativity on more practical and commercializable projects, rather than basic research that has little direct economic relevance for the country.[38] Commercialization of technology brings jobs, exports, and economic growth more immediately than basic research. Moreover, Lithuanian scientists who wish to engage in basic research today have the option of moving to universities in larger countries that can better afford to support such research. Although, this is frequently perceived as a "brain drain," which has an obvious negativity attached, it is also beneficial in terms of establishing and leveraging international cooperation.[39] Moreover actual progress in basic research is notably difficult to measure and may allow an easy ride for low quality faculty efforts.[40] The disproportionate resources required for fundamental research and the limited social returns require countries like Lithuania to set priorities for the commercialization of technology.

Until recently Lithuanian universities were bound by the general IPR rule, modifiable by contract, that copyrights are assigned to the university as the employer for 5 years (except rights in computer programs, which are deemed permanently assigned)[41] and university-activity-related inventions are automatically assigned to the university. University IP, in Lithuania as in the U.S., is created by the faculty, so the question is what incentives faculty have for such activity. As discussed above, the basic rationale for IPRs is that they act as an incentive for the creation of IP that would otherwise be vulnerable to misappropriation by others who do not share the cost of its initial creation in time, money, and effort. If all or part of the rights in university-created IP go to the university, rather than the faculty member, the incentive for faculty to create IP is reduced. If revenue from commercializable inventions is to be shared between the creating faculty member and the university, the question is what relative share optimizes the overall university goals. Lack of incentives discourages the faculty to produce commercially viable IPR, while ambiguous ownership status hampers commercialization.[42] All this unsurprisingly leads to minimal and ever decreasing university IPR generation in Lithuanian public universities in 2000-2006.[43]At present, universities in Lithuania do not have a TTO infrastructure to develop and commercialize university IP, and few if any universities have the money to set up a TTO and maintain it long enough for it to begin bringing in revenue (if it ever does). If the university keeps the IPRs but has no functioning commercialization infrastructure, the value of the IP can lie fallow and never get commercialized. If the creating faculty members have no chance of reasonable finan-

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[38] Lithuania - Aiming for a Knowledge Economy. The World Bank, March 2003. P. 70.

[39] Reducing "Brain Drain" and Repatriating "Brains." Final Report, Ministry of Science and Education of the Republic of Lithuania. <http://www.smm.lt/svietimo_bukle/docs/tyrimai/es/Protu%-20nutekejimo%20mazinimas_ataskaita.pdf>.

[40] See eg. Linda Butler. A list of published papers is no measure of value. Nature 419, 877 (31 October 2002)

[41] Cf. Article 9 of the Law on Copyright and Related Rights of the Republic of Lithuania, as well as Article 7 of the Law on Patents of the Republic of Lithuania.

[42] Lithuania—Aiming for a Knowledge Economy. The World Bank, March 2003. P. 12, 50, 99.

[43] Austė Kraujelytė. Intelektinė nuosavybė kaip e-verslo ir e-valdžios plėtros veiksnys. *Viešoji politika ir administravimas*, Nr. 17, 2006. P. 104-114.

cial return and do not own the IPRs, the usual faculty choice is likely to be simply to publish the results of his or her work, which means that patents are no longer possible and the IP evaporates into the public domain. On the one hand, this can actually be a positive development for society, because it means that the incentive of IPRs was, in this particular case, not necessary for the production of the information, and the information is not burdened by the monopoly represented by the IPR (although the philosophy behind Bayh-Dole is that many inventions will not be commercially developed without the patent shield). On the other hand, it is also likely that fewer patentable creations will arise out of Lithuanian universities or that some Lithuanian faculty members will do their work without fully disclosing it and attempt to commercialize independently when and if they achieve something that looks commercially promising. These negative effects are amplified by the overall low prestige and income offered for academic positions in the transition economies, such as Lithuania. The prior rules may also have stifled spin-off creation, and likely were a significant contributor to very low spin-off creation rates in Lithuania.[44] All this clearly suggests a need for stronger faculty incentives.

B. The newest initiative

The new Lithuanian Law on Science and Studies enacted in April 2009[45], which among other things regulates university and faculty IP matters[46], on its surface, is similar to the ABOR policy applicable to ASU. Significant differences, however, may be identified upon closer examination. Primarily these are the absence of direct provisions for the TTO model and a lack of regulatory clarity.

According to the Lithuanian legislation, the university is the default owner of all university-created IP. Faculty members are required to report all IP creation to the university (but there is no enforcement mechanism, no compliance incentives, and no meaningful sanctions for non-compliance). Creating faculty may receive 1/3 or more of the profit from commercializing the IP, unless agreed otherwise in the contract between the faculty member (researcher, PhD student, etc.). The faculty member has no say in where the university uses the university's share. These are the only significant differences from the general IP rules that governed university and faculty IP matters before May 2009.

Is 1/3 a sufficient share to give an incentive to the faculty to innovate? A 1/3 share may be insufficient if the faculty member intends to set-up a separate company to commercialize the IP (spin-off). Moreover, in essence, the 1/3 profit fraction for

[44] No precise data exist on the spin-off creation rates in Lithuania or other European countries due to difficulties in assessment and lack of uniform methodology for measurement thereof; nevertheless multiple qualitative studies in Lithuania have concluded that "number of spin-offs in Lithuania is very low" and "significant obstacles for spin-off creation exist in the legal regime , see e.g. Inovacijų versle plėtra: strateginiai prioritetai ir veiksniai (Promoting Business Innovation: Strategic Priorities and Factors) – Lithuanian innovation centre, 2007, P. 17-18 and Open Coordination Method Mixed Group of Policy Experts – CREST Country Evaluation Report on Lithuania, 2007, P. 3-12, 45-60.

[45] Law on Science and Studies of the Republic of Lithuania. Official Gazette, 2009-05-12, No. 54-2140.

[46] See Article 82 of the Law.

faculty creators is only a guideline, rather than a mandatory rule, since it may be modified either way by contract. Although a contract may be advantageous in some situations (e.g. textbook copyright), the absence of a guaranteed share for the faculty, as well as lack of experience in sharing the proceeds from IP, cut in the other direction. Uncertainty is rarely effective in encouraging innovation and creativity.

At present there is little in the way of an enforcement mechanism for university rights in IP. On the one hand, universities have little capacity or experience in enforcing their rights. On the other hand, both the past and new rules are biased in favor of the university and lack guarantees for the faculty members. Still, attempting to commercialize an invention alone is a dangerous strategy for the faculty member, because if the separate company is successful, it may not be difficult for the university to show that it is based on university-owned IP. And, of course, it is only the successful companies that are worth worrying about. In any event, no IP policy should be constructed in such a way that it encourages faculty members to flout the law.

Even further uncertainty is programmed in the lack definition of "profit" from IP in the new regulation. It is uncertain whether net or gross income is assumed and whether royalties are tantamount to "profit." It is also uncertain who shall bear the cost of obtaining, maintaining and enforcing IP (a very significant sunk cost, which in many situations must be borne before the commercial value of IP is ascertained). Although placing these costs on the university (which is a commonly offered basis for university default ownership of faculty IP) may initially seem a reasonable solution, costs associated with obtaining IP can act as a kind of quality control. Given that the faculty member has the deepest knowledge concerning the IP, guaranteed faculty rights to proceeds from development of the IP may supply the incentive for the faculty creators to seek commercial investors who can cover the costs and other start-up expenses. Such scenario may be the most desirable, as it offers both an efficient use of public funds as well as greatest likelihood of commercialization.

Unfortunately the Lithuanian model overlooks the importance of a functioning and effective TTO at the university. If the creating faculty member works with the university's TTO, the TTO may work to set up a separate company for commercialization (spin-off). Depending on how "profit" is defined, the separate company might not be commercially viable if it can keep only 1/3 of the income, because it takes all the risk. There is no reason that the university should not agree to a lower amount, especially where further investment will be necessary to develop the invention (which is almost always the case)[47], although lack of sharing experience in Lithuania may be an important obstacle. The key, however, is having an operating and busi-

[47] Stanford reportedly owned about 1.8 million shares of Google at the time of the public offering in 2004, worth about $156 million at the public offering price of $85 per share. Jim Hopkins, *Founder' alma mater to rake in nearly $16M*, in USA TODAY, August 19, 2004 <http://www.usatoday.com/money/industries/technology/2004-08-19googlestanford-_x.htm?loc=-interstitialskip>. According to Wikipedia, Google at that time had 271 million shares outstanding, implying that Stanford's ownership was less than 1%. By the end of 2004, Google shares were trading for around $200/share. Assuming Stanford still had most of its shares, their value was some $350 million.

ness-knowledgeable TTO with which the faculty member, and other potential developers of the IP, can negotiate.

It is clear that efficient TTOs will not be established and in efficient operation overnight. Even in the US, where TTO role models are relatively abundant, it takes a few years if not longer. However, long-term policy for the transition economies should still be centered around the TTO model, if not for direct economic benefit, then for the indirect benefits observed in the ASU TTO experience.

Until viable and efficient TTOs are established in Lithuania, commercial development of university-created IP is most likely to come via the faculty member who creates it. That person best knows the technological field and the people who work in it. That person also has the greatest incentive to commercialize the innovation, as long as he is certain about the possibility of profiting from it. Active faculty member involvement in the ongoing commercialization process is likely vital to its success. Therefore, during the transition to a full fledged TTO model, a reform of the current rules may run a greater chance of success if: (1) Default ownership of IP is in the faculty; and (2) a TTO or TT infrastructure is established to which all university-created IP must be disclosed, along with plans for its commercialization. The university should have a right to participate in the profits, although the primary role of the university TTO should be aiding the faculty member in finding commercial investors and partners for obtaining and commercializing the IP, as well as counseling the faculty member in enforcing the IPRs and other rights against the third parties (including the said investor). The university share of the profit should not be pre-set but rather agreed on a case-by-case basis. The costs of obtaining, maintaining and enforcing the IP thus will be mitigated by the TTOs but not fully borne by them.

Moreover, the US experience suggests that TTOs may benefit from economies of scale—major initial investment, maintenance costs, and adopting a long-term profit horizon may be a significant burden on budget strapped Lithuanian universities. Some of this burden, however, may be somewhat offset if several universities consolidate their efforts and resources in one TTO per country or region. Such consolidated TTOs may provide the additional benefit of establishing and running a social network of the faculty and entrepreneurs in a particular field of technology.

Conclusions

Summarizing this overview of the US experience and Lithuanian attempts to facilitate the generation and commercialization of university IP, we draw the following conclusions:

1. Rewarding the faculty for generating commercially valuable IP is the universal formula for encouraging innovation and creativity.
2. Based on the US experience TTOs seem the primary vehicle enabling the university and faculty to reap the benefits of faculty generated IP. TTOs enable professional commercialization without distracting the faculty from their direct work.

3. Based on the US experience the downsides of the TTO model must be acknowledged, including the significant cost of running an efficient TTO, a long-term profitability horizon, and dependence on blockbuster patents. On the other hand, unexpected benefits of university TTO are seen in teaching and training students in the realities of business formation and operation, such as entrepreneurship skills.
4. Lithuanian attempts to foster TT through setting a particular distribution of income from IP may be insufficient without a proper TTO infrastructure and without clearly delineating "income" for different types of IP and commercialization vehicles.
5. Consolidated TTOs (one TTO for several universities in the region) may partially address the cost problem seen in the US and may be a long-term university IP policy model, while in the short term stronger emphasis on faculty incentives (such as faculty IP ownership aided in commercialization and enforcement by the TTO) may introduce the necessary transparency and kick start university innovation in transition economies, such as Lithuania.

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INTELEKTINĖS NUOSAVYBĖS TEISĖS UNIVERSITETE: LIETUVOS IR JAV PAVYZDŽIAI

Dennis KARJALA, Mindaugas KIŠKIS

Santrauka. Straipsnyje nagrinėjamas intelektinės nuosavybės institutas ir jo vaidmuo universitetuose, skatinant dėstytojų ir tyrėjų kūrybiškumo komercinimą. Šiuolaikiniame universitete vis svarbesnis darosi mokslinės produkcijos taikymas ūkyje, t. y. jos komercinimas, o intelektinė nuosavybė yra vienas iš tradicinių technologijų perdavimo ir mokslo rezultatų komercinimo instrumentų. Straipsnyje intelektinės nuosavybės teisės nagrinėjamos ne tik teisiniu požiūriu. Autoriai gilinasi į vadybinius-ekonominius aspektus, atskleidžiamas ir analizuojamas intelektinės nuosavybės teisių kaip ekonominės kūrybiškumo paskatos mechanizmas.

Straipsnio tikslas – kritiškai įvertinti JAV ir Lietuvos vadybines ir viešosios politikos nuostatas dėl intelektinės nuosavybės teisių universitetuose, pateikti jų tobulinimo pasiūlymus. Nagrinėjamas tradicinis technologijų perdavimo modelis ir jo efektyvinimo galimybės. Ypač daug dėmesio analizėje skiriama technologijų perdavimo centrų modeliui ir jų praktiniams aspektams.

Autoriai, remdamiesi asmenine patirtimi, analizuoja Arizonos valstijos universiteto Technologijų perdavimo centro veiklą, ją reguliuojančius teisinius ir politinius dokumentus. Taip pat analizuojami bandymai išjudinti technologijų perdavimą Lietuvoje, nustatant naujas teisines ir vadybines taisykles 2009 m. Mokslo ir studijų įstatyme.

Autoriai daro išvadas, kad technologijų perdavimo centrai turi dvilypę naudą universitetams. Be mokslininkų ir tyrėjų darbo komercinimo, pasireiškia ir šalutinė nauda – technologijų perdavimo integravimas į studijų procesą, leidžiantis studentams tiesiogiai dalyvauti mokslo ir verslo bendradarbiavimo santykiuose. Be to, atsižvelgiant į JAV patirtį ir problemines technologijų perdavimą Lietuvoje, siūlomos technologijų perdavimo centrų vadybos inovacijos. Autorių nuomone, technologijų perdavimo procesas būtų efektyvesnis, jeigu mokslininkams ir tyrėjams būtų suteikiamos ekonominės intelektinės nuosavybės teisės, tai kaip buvo JAV devintajame dešimtmetyje. Kaip reformos kryptis Lietuvoje pasirinktas automatinis teisių perdavimas universitetams ekonomiškai neveiksmingas, nes universitetai (ypač Lietuvoje) stokoja komercinimo gebėjimų, o esamos kompensavimo sistemos mokslininkams ir tyrėjams nepakankamai kompensuoja kūrybiškumą ir inovacinį darbą. Lietuvai siūlomas efektyvesnis technologijų perdavimo modelis. Reiktų įsteigti vieną ar du technologijų perdavimo centrus, kurie aptarnautų kelis universitetus, nustatyti privalomą sukurtų ir perduodamų technologijų bei mokslo rezultatų deklaravimą ir deponavimą, o visas ekonomines intelektinės nuosavybės teises suteikti patiems mokslininkams ir tyrėjams.

Dennis Karjala Arizonos valstijos universiteto Sandra Day O'Connor teisės koledže dirba nuo 1978 m. 1981 m. paskirtas į teisės profesoriaus pareigas. 2001 m. jam suteiktas Willardo H. Pedricko nusipelniusio tyrėjo vardas, o 2002 m. paskirtas pirmuoju Jacko E. Browno teisės profesoriumi. Moksli-

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