

Summer 2016

University IP: The University as Coordinator of the Team Production Process

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Recommended Citation

Estreicher, Samuel and Yost, Kristina A. (2016) "University IP: The University as Coordinator of the Team Production Process," *Indiana Law Journal*: Vol. 91 : Iss. 4 , Article 1.

Available at: <https://www.repository.law.indiana.edu/ilj/vol91/iss4/1>

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University IP: The University as Coordinator of the Team Production Process

SAMUEL ESTREICHER & KRISTINA A. YOST*

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INTRODUCTION

This Article focuses on intellectual property (IP) issues in the university setting. Often, universities require faculty who have been hired in whole or in part to invent to assign inventions created within the scope of their employment to the university. In addition, the most effective way to secure compliance with the Bayh-Dole Act,¹ which deals with ownership of inventions involving federally funded research, is for the university to take title to such inventions. Failure to specify who has title can result in title passing to the government. Once the university asserts ownership, it then decides whether to process a patent application, and if it does, whether to pursue options for commercialization—frequently including licensing the invention to industry.

A number of academics and other commentators have contended that it would be more efficient and fair to allow faculty to own the rights to their own inventions, even if they have been hired in part to invent and the inventions are created within the scope of employment. The debate, it should be noted, is only over the appropriate default rule. Not even critics of the current institutional default rule would object to faculty assignment of ownership rights to the university. Since faculty are not generally in a good position to pursue commercialization on their own, the question for public policy is whether the university or some other entity should, in the first instance, manage the commercialization process.

This Article evaluates the case for changing the ownership default rule. First, we provide background on patent rights in the employment setting and how patent rights are applied in a university environment. Second, we explain how most universities handle faculty inventions and technology transfer. Third, we lay out and challenge some of the key arguments critics have offered in support of faculty control of patent rights. Finally, we suggest that faculty inventions that use university resources, including personnel such as graduate and postdoctoral students, are best viewed as a product of a team production process rather than solely as the invention of the faculty member and that the university generally is the more efficient manager of commercialization efforts.

I. FACULTY RIGHTS TO INVENTIONS

A. Employee Patent Rights

In general, employees have the right to own their inventions unless they are hired or assigned to do inventive work. In contrast, employees hired or assigned to do inventive work are considered to have assigned all patent rights to their employers.² As explained by the Supreme Court in 1933, the rationale is as follows:

1. Pub. L. No. 96-517, 94 Stat. 3015, 3019–28 (1980) (codified as amended at 35 U.S.C. §§ 200–12 (2012)).

2. *United States v. Dubilier Condenser Corp.*, 289 U.S. 178, 187 (1933); RESTATEMENT OF EMP'T LAW § 8.09(b) (2015). One of us (Estreicher) served as the Chief Reporter of the Restatement.

One employed to make an invention, who succeeds, during his term of service, in accomplishing that task, is bound to assign to his employer any patent obtained. The reason is that he has only produced that which he was employed to invent. His invention is the precise subject of the contract of employment. A term of the agreement necessarily is that what he is paid to produce belongs to his paymaster. On the other hand, if the employment be general, albeit it cover a field of labor and effort in the performance of which the employee conceived the invention for which he obtained a patent, the contract is not so broadly construed as to require an assignment of the patent.³

Even if an employee is not hired or assigned to invent, the employer and employee can enter into a reasonable agreement to assign patent rights to inventions created during the employee's employment with the employer.⁴ If an employee is not hired or assigned to do inventive work, the agreement may be limited to requiring the employee to assign patents to inventions created during work time or using the employer's resources, or that relate to the employer's line of business.⁵ Such agreements, if properly limited, are enforceable.

3. *Dubilier*, 289 U.S. at 187 (citation omitted).

4. RESTATEMENT OF EMP'T LAW § 8.11; *see, e.g.*, *Cubic Corp. v. Marty*, 229 Cal. Rptr. 828 (Ct. App. 1986) (enforcing employee agreement to assign invention to employer where invention was within the scope of employer's business and the employee used company personnel in developing it).

5. A number of states have enacted statutes allowing for employee assignment of inventions under similar conditions. *See* CAL. LAB. CODE § 2870 (West 2011) (“(a) Any provision in an employment agreement which provides that an employee shall assign, or offer to assign, any of his or her rights in an invention to his or her employer shall not apply to an invention that the employee developed entirely on his or her own time without using the employer's equipment, supplies, facilities, or trade secret information except for those inventions that either: (1) Relate at the time of conception or reduction to practice of the invention to the employer's business, or actual or demonstrably anticipated research or development of the employer; or (2) Result from any work performed by the employee for the employer.”); DEL. CODE ANN. tit. 19, § 805 (2013) (“Any provision in an employment agreement which provides that the employee shall assign or offer to assign any of the employee's rights in an invention to the employee's employer shall not apply to an invention that the employee developed entirely on the employee's own time without using the employer's equipment, supplies, facility or trade secret information, except for those inventions that (1) Relate to the employer's business or actual or demonstrably anticipated research or development; or (2) Result from any work performed by the employee for the employer. To the extent a provision in an employment agreement purports to apply to the type of invention described, it is against the public policy of this State and is unenforceable. An employer may not require a provision of an employment agreement made unenforceable under this section as a condition of employment or continued employment.”); KAN. STAT. ANN. § 44-130 (2000); MINN. STAT. ANN. § 181.78 (West 2006); N.C. GEN. STAT. ANN. §§ 66-57.1-2 (West 2012); WASH. REV. CODE ANN. §§ 49.44.140-150 (West 2008).

B. University Faculty Patent Rights

Under the general framework applied to inventions of employees, the inquiry that determines whether faculty members own the rights to their inventions is whether they are “hired to invent.” There are, surprisingly, very few court decisions addressing this issue. In *Speck v. North Carolina Dairy Foundation*,⁶ for example, two faculty members conducted research on a specific type of bacteria that could be added to milk without leaving a sour taste.⁷ The faculty researchers disclosed the invention to the university in order to obtain its assistance in developing and marketing the process as well as securing necessary legal protection (such as a trademark on the name “Sweet Acidophilus”).⁸ The faculty researchers sued when they did not receive royalties from the process, challenging the university’s claim to ownership.

Although the university in the *Speck* case had a patent policy, the policy did not expressly address ownership of trade secrets or trademarks.⁹ Nonetheless, the state high court ruled for the university:

[The plaintiff faculty members] developed the secret process for improved methods of preparation and preservation of concentrates of lactobacillus acidophilus while employed as teachers and researchers to engage *inter alia* in just such research and development for the University. . . . [T]he University was the place where they discovered the secret process and . . . the resources provided them for their research by the University enabled them to discover the process. Under these facts, the secret process developed through the research of the plaintiffs belonged to the University absent a written contract by the University to assign.¹⁰

Since the faculty members had been hired to invent, the court reasoned, their discovery belonged to the university.

Different facts may lead to different outcomes. In *Speck*, the university was aware of the research and specifically encouraged it,¹¹ which weighed in favor of the finding that the faculty members had been hired to invent in ways that other faculty researchers are not.¹²

6. 319 S.E.2d 139 (N.C. 1984).

7. *Id.* at 140–41.

8. *Id.* at 141–42.

9. *Id.* at 144.

10. *Id.* at 143 (italics in original).

11. *Id.* at 144.

12. For criticism of the approach taken in a case like *Speck*, see, e.g., Pat K. Chew, *Faculty-Generated Inventions: Who Owns the Golden Egg?*, 1992 WIS. L. REV. 259, 298–304; Sunil R. Kulkarni, Note, *All Professors Create Equally: Why Faculty Should Have Complete Control over the Intellectual Property Rights in Their Creations*, 47 HASTINGS L.J. 221, 232 n.64 (1995).

II. UNIVERSITY PATENT AND TECHNOLOGY TRANSFER POLICIES

A. University Patent Ownership

Due in part to the legal framework that recognizes employee-inventors' patent rights in their inventions unless they are hired to invent, many universities have issued policies on patent ownership and technology transfer. These policies purportedly assign to the university patent rights to inventions created by faculty members within the scope of employment, using university resources or funding, or pursuant to a specific contractual arrangement with the university.¹³

The policies vary in scope. Some universities seek to own the rights only to inventions using university resources or funding. For example, M.I.T.'s policy states that inventions "are owned by M.I.T. when either of the following applies": (1) "[t]he intellectual property was developed in the course of or pursuant to a sponsored research agreement with M.I.T."; or (2) "[t]he intellectual property was developed

13. See, e.g., HARVARD UNIV., STATEMENT OF POLICY IN REGARD TO INTELLECTUAL PROPERTY § I.C (2013), available at http://otd.harvard.edu/upload/files/IP_Policy_12-12-13_FINAL.pdf [<https://perma.cc/6X83-9DAF>] ("Harvard shall have the right to own and each Inventor, at Harvard's request, shall assign to Harvard all of his/her right, title and interest in a Supported Invention."); N.Y. UNIV., STATEMENT OF POLICY ON INTELLECTUAL PROPERTY (2012), available at <http://www.nyu.edu/content/dam/nyu/compliance/documents/IPPolicy.pdf> [<https://perma.cc/9FEQ-RZMN>]; OFF. TECH. MGMT., PENN ST. UNIV., AN INVENTOR'S GUIDE TO TECHNOLOGY TRANSFER AT PENN STATE UNIVERSITY 15 (n.d.), available at <http://www.research.psu.edu/patents/education-and-training/PSU-Inventors-Guide-to-Technology-Transfer.pdf> [<https://perma.cc/3698-3B68>] ("[A]s a general rule, the University owns inventions made by its employees while acting within the scope of their employment or using University resources."); UNIV. OF CAL., PATENT POLICY 2 (1997), available at <http://policy.ucop.edu/doc/2500493/PatentPolicy> [<https://perma.cc/YY9B-5NXX>] ("An agreement to assign inventions and patents to the University, except those resulting from permissible consulting activities without use of University facilities, shall be mandatory for all employees"); YALE UNIV., YALE UNIVERSITY PATENT POLICY § 3 (1998), available at http://ocr.yale.edu/sites/default/files/files/Yale_Patent_Policy.pdf [<https://perma.cc/U8KH-ZHJA>] ("Inventors shall execute assignments or other documents assigning to the University all . . . rights in the invention"); *Patent Policy*, CALTECH OFF. GEN. COUNS., <https://www.ogc.caltech.edu/forms/patentpolicy> [<https://perma.cc/SE8J-3FMK>] (last revised Mar. 13, 2007) ("[For] [i]nventions made by employees in the line of Institute duty or with the use of Institute facilities [t]itle to such patents is to be assigned to the Institute or, if appropriate, the sponsor."); *Obligations and Responsibilities of Officers of Instruction and Research, Intellectual Property*, COLUM. U., <http://www.columbia.edu/cu/vpaa/handbook/obligations.html> [<https://perma.cc/7GM5-NQDH>] (last revised Nov. 2008) ("Unless it has specifically waived its rights, the University holds the intellectual property rights to patentable inventions and discoveries, and any associated technology, that result primarily from the use of its facilities or from the activity of its officers while engaged in its service."); 9.1 *Inventions, Patents, and Licensing*, § 1.A.1 STAN. U., <https://doresearch.stanford.edu/policies/research-policy-handbook/intellectual-property/inventions-patents-and-licensing> [<https://perma.cc/7EYB-WZMZ>] (last revised June 19, 2013) ("[Title to] inventions conceived or first reduced to practice in whole or in part . . . in the course of . . . University responsibilities or with more than incidental use of University resources . . . shall be assigned to the University").

with significant use of funds or facilities administered by M.I.T.”¹⁴ In other words, the university asserts the rights only over inventions developed under a specific agreement or that involved the “significant use” of M.I.T. funds or facilities.

In contrast, Harvard University requires faculty to assign ownership over inventions that are “conceived or reduced to practice in whole or in part” (1) “[u]nder or subject to an agreement between Harvard and a third party”; (2) “[w]ith use of direct or indirect financial support from Harvard”; or (3) “[w]ith use (other than incidental use) of space, facilities, materials or other resources provided by or through the University.”¹⁵ The reference to “direct or indirect financial support” and “use (other than incidental use) of space, facilities, materials or other resources” suggests that Harvard’s policy facially has a broader reach than M.I.T.’s.

Other university policies speak in terms of rights to any inventions conceived or reduced to practice in the scope of the faculty member’s employment. For example, NYU’s policy states:

Inventions . . . are owned by NYU if conceived, reduced to practice or developed, in whole or part: (1) in the scope of NYU employment or other duties at or for NYU; or (2) in connection with training, research or clinical activities at or under the auspices of NYU; or (3) with [s]ubstantial [u]se of [u]niversity [r]esources; or (4) the [i]nvention is subject to the rights of research sponsors or other third parties under agreements duly entered into or agreed to by NYU.”¹⁶

The University of Pennsylvania similarly requires

all inventions . . . which are conceived or reduced to practice . . . in the course of employment at the University, or result from work directly related to professional or employment responsibilities at the University, or from work carried out on University time, or at University expense, or with substantial use of university resources . . . are the property of the University, effective immediately as of the time such inventions are conceived or reduced to practice.¹⁷

Some policies seem broader still. For example, Yale University’s policy requires assignment of all inventions of university employees unless the “University determines that an invention . . . is unrelated to the activities for which the individual is employed and has not involved the use of University facilities.”¹⁸

Some universities require faculty members to execute an agreement as a term or condition of employment assigning all such inventions to the university. For

14. *Part 2: MIT Policy Statements, 2.1 Patent and Copyright Ownership Policy Statement*, M.I.T. TECH. LICENSING OFF., <http://tlo.mit.edu/community/policies/part2> [https://perma.cc/PK7F-2XEF] (last updated 2015).

15. HARVARD UNIV., *supra* note 13, § I.A.

16. N.Y. UNIV., *supra* note 13, § III.A.1.

17. UNIV. OF PA., *PATENT AND TANGIBLE RESEARCH PROPERTY POLICIES AND PROCEDURES OF THE UNIVERSITY OF PENNSYLVANIA* § 2.0 (2010), *available at* <http://www.upenn.edu/research/RevisedPatentPolicy5-19-10.pdf> [https://perma.cc/F53Y-SNMP].

18. YALE UNIV., *supra* note 13, § 6.

example, Caltech requires its faculty members to sign a patent and copyright agreement¹⁹ stating as follows:

I will notify the Institute promptly of all inventions or copyrightable materials that I have developed in the course of my duties at or for the Institute . . . or with any use of facilities owned or managed by the Institute. I agree to assign, and hereby do assign, to the Institute all such inventions²⁰

Other universities, such as Harvard, do not require the faculty member to actually sign a document assigning inventions to the university until such time as the invention is disclosed and the university decides to assert an ownership right.²¹

Typically, universities do not own the patent rights to inventions created either pursuant to an outside consulting arrangement or outside the scope of the faculty member's employment.

B. The Bayh-Dole Act

The Bayh-Dole Act²² alters the traditional division of IP rights in the university setting. Prior to Bayh-Dole, there was no uniform law that governed who had ownership rights to inventions from federally funded research. Each agency had its own regulations, but ownership of inventions resulting from federally funded research typically belonged to the government.²³ The individual inventor had no right to assign his inventions to third parties because title to the invention vested in the government.²⁴ The government often licensed rights to use patents on a nonexclusive

19. *Patent Policy*, *supra* note 13 (“All Institute employees shall sign a Patent and Copyright Agreement assigning their rights to patents or inventions that they may make in the line of their duties, or with any use of Institute facilities, to the Institute or, if appropriate, its sponsor.”).

20. *California Institute of Technology Patent and Copyright Agreement*, CALTECH OFF. GEN. COUNS., <https://www.ogc.caltech.edu/forms/patentagreement> [<https://perma.cc/9D36-SMP2>] (last revised Mar. 1, 2012). M.I.T., Penn State, the University of California, and the University of Pennsylvania also appear to require faculty to sign an agreement assigning inventions to the university at the commencement of employment. *See Part 5: Faculty, Student, Staff and Visitor Obligations, 5.0 General Policy*, M.I.T. TECH. LICENSING OFF., <http://tlo.mit.edu/community/policies/part5> [<https://perma.cc/6JA5-NZWH>] (last updated 2015) (stating M.I.T.'s requirement); *Faculty Consulting Agreements*, PENNSTATE, <http://www.research.psu.edu/patents/policies/faculty-consulting-agreements> [<https://perma.cc/T6T9-9QW2>] (last modified Jan. 11, 2013) (describing the requirements of Penn State's Intellectual Property Agreement); UNIV. OF CAL., *supra* note 13, at 2 (mandating assignment agreements at the University of California); UNIV. OF PA., *supra* note 17, § 2.1.1 (mandating participation agreements at the University of Pennsylvania).

21. HARVARD UNIV., *supra* note 13, § I.C (“Harvard shall *have the right to own* and each Inventor, *at Harvard's request*, shall assign to Harvard all of his/her right, title and interest in a Supported Invention.” (emphasis added)).

22. Pub. L. No. 96-517, 94 Stat. 3015, 3019–28 (1980) (codified as amended at 35 U.S.C. §§ 200–12 (2012)).

23. *See* H.R. REP. NO. 96-1307, pt. 1, at 3 (1980); S. REP. NO. 96-480, at 2 (1979).

24. *FilmTec Corp. v. Hydranautics*, 982 F.2d 1546, 1550, 1553 (Fed. Cir. 1992).

basis, which resulted in private companies having diminished interest in commercially developing any inventions.²⁵

Congress enacted the Bayh-Dole Act in 1980 with the goal of promoting the commercialization of inventions that develop as the result of federal financial support.²⁶ The legislation provides that a federal “contractor,” defined as “any person, small business firm, or nonprofit organization that is a party to a funding agreement,”²⁷ may “elect to retain title to any subject invention.”²⁸ A “subject invention” is defined as “any invention of the contractor conceived or first actually reduced to practice in the performance of work under a funding agreement.”²⁹ Thus, after Bayh-Dole, on federally funded projects, the university, which is a party to the funding agreement, has the right to retain title in any subject invention.

If the federal contractor—in this context, the university—fails to comply with certain obligations under the Act, the federal government may receive title to a subject invention. The government also has other rights: the agency that granted the federal funds receives a “nonexclusive, nontransferable, irrevocable, paid-up license to practice . . . [the] subject invention”³⁰ and “march-in rights” where, under certain circumstances, it can grant a license to a responsible third party.³¹ In addition, where the contractor does not elect to retain title, the government may grant requests for retention of rights by the inventor.³²

The issue before the Supreme Court in *Board of Trustees of the Leland Stanford Junior University v. Roche Molecular Systems, Inc.*³³ was whether under Bayh-Dole title to “subject” (i.e., federally funded) inventions automatically vests in universities or whether the Act simply gives universities the right to contract for such title. The Court held that Bayh-Dole does not alter the prior common law and does not itself give universities title in such inventions; if they do not have title as a matter of common law, they must contract with the faculty inventors in order to obtain title on subject inventions.³⁴ Thus, in the wake of *Roche*, it has become even more critical for universities to ensure that their faculty members properly assign rights in any inventions conceived as a result of federal funding to the universities.

C. Technology Transfer

Subsequent to the passage of Bayh-Dole, many large research universities have developed technology transfer offices to manage the process of reviewing faculty

25. See, e.g., *The University and Small Business Patent Procedures Act: Hearings on S. 414 Before the S. Comm. on the Judiciary*, 96th Cong. 185 (1979).

26. Michael Sweeney, Comment, *Correcting Bayh-Dole's Inefficiencies for the Taxpayer*, 10 NW. J. TECH. & INTELL. PROP. 295, 295 (2012).

27. 35 U.S.C. § 201(c) (2012).

28. *Id.* § 202(a).

29. *Id.* § 201(e).

30. *Id.* § 202(c)(4).

31. *Id.* § 203.

32. *Id.* § 202(d).

33. 131 S. Ct. 2188 (2011).

34. *Id.* at 2197 (“The Bayh-Dole Act does not confer title to federally funded inventions on contractors or authorize contractors to unilaterally take title to those inventions; it simply assures contractors that they may keep title to whatever it is they already have.”).

inventions and seeking patent protection and/or commercializing them.³⁵ Most of these universities require faculty members to disclose potentially patentable inventions to the university technology transfer office. University policies differ on the scope of required disclosures. Some universities require disclosure of all inventions created by the faculty member; after such disclosure, the university technology transfer office determines whether the university has any claim to ownership. For example, Harvard University's technology transfer policy purports to require faculty to disclose all inventions to the university.³⁶ The University of California and University of Pennsylvania policies are similar.³⁷

Other universities leave more discretion in the hands of their faculty members and require reporting only certain types of inventions. For example, M.I.T.'s policy requires disclosure only of inventions that would belong to M.I.T. under the terms of its patent policy, including inventions developed through sponsored programs, works for hire, and inventions that involved a significant use of M.I.T. funds or facilities.³⁸ M.I.T.'s policy further affords faculty inventors the option to bring inventions to the technology licensing office that are not owned by M.I.T. under the patent policy if the inventor wishes to use the office to assist in commercializing it and receive the standard associated benefits in return for assigning the invention to M.I.T.³⁹

A minority of universities give faculty members the option of not disclosing inventions to the technology transfer office and instead pursuing patent protection or commercializing the invention through other means. For example, Stanford University generally requires disclosure of inventions that come within the scope of its patent policy, but allows the inventor to place his or her invention in the public domain if such placement is in the best interest of its transfer and does not violate any agreements (such as federal-funding agreements) that are related to the work.⁴⁰

The University of Wisconsin's policy appears to be quite voluntarist. It does not require faculty members to assign their rights to inventions that are developed outside of federal-funding arrangements or other contractual arrangements in which title is assigned to the university, instead allowing faculty to retain rights in those inventions.⁴¹ Pursuant to that policy,

35. Rochelle Cooper Dreyfuss, *Double or Nothing: Technology Transfer Under the Bayh-Dole Act*, in *BUSINESS INNOVATION AND THE LAW* 52, 56 (Marilyn Pittard, Ann L. Monotti & John Duns eds., 2013).

36. HARVARD UNIV., *supra* note 13, § I.B (“Covered persons are required to notify the University’s Office of Technology Development . . . of each Supported Invention and Incidental Invention . . .”).

37. See UNIV. OF CAL., *supra* note 13, at 2; UNIV. OF PA., *supra* note 17, §§ 2.1.2–3.

38. *Part 3: Technology Evaluation, Protection and Dissemination, 3.1 Disclosure*, M.I.T. TECH. LICENSING OFF., <http://tlo.mit.edu/community/policies/part3> [https://perma.cc/HUN5-AWVA] (last updated 2015).

39. *Part 4: Commercial Development, 4.1.2 Inventor/Author Owned Technology*, M.I.T. TECH. LICENSING OFF., <http://tlo.mit.edu/community/policies/part4#41> [https://perma.cc/QZA8-ZVR3] (last updated 2015).

40. *9.1 Inventions, Patents, and Licensing*, *supra* note 13, § 2.E.

41. See *G34: Patent Policy, II. Background*, U. Wis. SYS., <https://www.wisconsin.edu/financial-administration/financial-administrative-policies-procedures/gapp-numeric-index/g34-patent-policy/> [https://perma.cc/8ZQ5-588K] (last revised Dec. 10, 1985) (“In the absence of contractual provisions obligating transfer of all or some proprietary rights in an invention, the inventor

When, after review by the Chancellor or his or her designee, it has been determined that no third party is contractually entitled to exercise control over the proprietary rights in an invention, or that no contractual agreement exists with the institution, the inventor will be so advised and will be free to dispose of the invention.⁴²

The inventor then has the option to submit the invention to the university licensing office or pursue other avenues on his or her own.⁴³

Once the university determines that it has an ownership claim to an invention, the technology transfer office then makes a determination as to whether the invention is likely to be commercially valuable and whether to pursue a patent application.⁴⁴ If the university does pursue a patent application, it will also seek to license or otherwise commercialize the invention for further development by industry.⁴⁵

As a general matter, these university policies envision, if commercial development occurs, payment of significant royalties to the faculty member and faculty member's department to support further research.⁴⁶ This is also a requirement of Bayh-Dole.⁴⁷

III. ARGUMENTS IN SUPPORT OF FACULTY OWNERSHIP

The current approach to university IP has been criticized on a number of grounds. Some critics appear to suggest that it would be preferable for individual faculty

traditionally is free to dispose of those rights in the manner of his or her own choosing.”).

42. *Id.* at III.G *Unrestricted Inventions*.

43. *Id.*

44. *See, e.g., Part 4: Commercial Development*, M.I.T. TECH. LICENSING OFF., <http://tlo.mit.edu/community/policies/part4> [<https://perma.cc/8LJ7-4QDL>] (last updated 2015).

45. *Id.*

46. *See, e.g., HARVARD UNIV., supra* note 13, § V.B.ii (50% to inventor, 35% is “personal share” and 15% is “research share,” with remainder to inventor’s department/center, school, and to President); N.Y. UNIV., *supra* note 13, § V.B (42.5% of net proceeds to inventor, with 2/3 of remaining net proceeds to inventor’s school and 1/3 to NYU); OFF. TECH. MGMT., PENN ST. UNIV., *supra* note 13, at 32 (40% of royalties from license to inventor, with remaining 40% to Penn State Research Foundation and 20% to administrative unit); UNIV. OF CAL., *supra* note 13, at 3 (35% of royalties to inventor, with an additional 15% allocated for research-related purposes on the inventor’s campus or lab); YALE UNIV., *supra* note 13, § 4(d) (net royalties to inventor in the amount of 50% on first \$100,000, 40% of \$100,000–\$200,000 and 30% above \$200,000, with remainder to university research); *Appendix D—Statement of Policy on Proprietary Rights in the Intellectual Products of Faculty Activity, Appendix, II. Allocations*, COLUM. U., <http://www.columbia.edu/cu/vpaa/handbook/appendixd.html> [<https://perma.cc/7LZB-WHXS>] (last revised Nov. 2008) (50% of first \$100,000 to inventor, 25% for amounts on top of that, with sums also distributed to department/faculty, inventor’s research, and university); *Part 4: Commercial Development, 4.8 Royalty Distribution*, M.I.T. TECH. LICENSING OFFICE, <http://tlo.mit.edu/community/policies/part4#48> [<https://perma.cc/W8TF-8XZY>] (last updated 2015) (1/3 of adjusted royalty income to inventor with sums also going to departments and centers and general fund); *Patent Policy*, *supra* note 13 (25% to inventor, with remainder to furtherance of research); *9.1 Inventions, Patents, and Licensing*, *supra* note 13, § 3 (after 15% deduction for administrative overhead, 1/3 to inventor, 1/3 to department and 1/3 to school).

47. *See* 35 U.S.C. § 202(c)(7) (2012).

members to have the patent rights to their own inventions. We discuss below the various arguments that have been made by those advocating this approach.

A. Are Universities Principally Interested in Maximizing Revenue Rather than Facilitating Effective Technology Transfer?

1. Focus on Revenue

Robert Litan, Lesa Mitchell, and E.J. Reedy of the Kauffman Foundation, for example, argue that technology transfer offices are currently set up to maximize revenue for the office, rather than act in the interest of the widest dissemination of technology.⁴⁸ Because universities require faculty disclosure of their inventions, the technology transfer offices have ended up, in their view, serving as gatekeepers determining whether inventions get commercialized rather than simply facilitating the process.⁴⁹ These offices are said to focus on finding the biggest moneymaking inventions rather than those that may be less financially rewarding but socially valuable or beneficial in some other way.

Litan, Mitchell, and Reedy rely extensively on data from a 2005 study by Markman, Phan, et al. showing that “[l]icensing for royalties” appeared more than any other objective in the mission statements of technology transfer offices.⁵⁰ They ignore, however, that other objectives such as “[i]ntellectual property protection/management” and “[p]ublic good” also appear in these statements.⁵¹

Since 2005, substantial efforts have been made to widen the horizon of university technology transfer programs. An influential guide has been the “Nine Points To Consider” (“Nine Points”) issued by the Association of University Technology Managers (AUTM), which sets out appropriate factors to consider in developing approaches to licensing technology.⁵² Among the nine factors is to “[c]onsider including provisions that address unmet needs, such as those of neglected patient populations or geographic areas.”⁵³ The Nine Points elaborates that “Universities should strive to construct licensing arrangements in ways that ensure that these underprivileged populations have low- or no-cost access to adequate quantities of these medical innovations.”⁵⁴ Many universities have endorsed these goals.

Universities have begun to embrace, at least at the conceptual level, noncommercial objectives. For example, Columbia University’s Statement of Policy on Proprietary Rights in the Intellectual Products of Faculty Activity states:

48. Robert E. Litan, Lesa Mitchell & E.J. Reedy, *Commercializing University Innovations: Alternative Approaches*, 8 INNOVATION POL’Y & ECON. 31, 32 (2007).

49. *Id.* at 43.

50. *Id.* at 43 tbl.2.2.

51. *See id.*

52. ASS’N OF UNIV. TECH. MANAGERS, IN THE PUBLIC INTEREST: NINE POINTS TO CONSIDER IN LICENSING UNIVERSITY TECHNOLOGY (2007), available at http://www.autm.net/AUTMMain/media/Advocacy/Documents/Points_to_Consider.pdf [<https://perma.cc/TWY5-W3ME>].

53. *Id.* at 8.

54. *Id.*

University policy does not require that the commercial value of a conception be exploited to the full; the University applauds the selfless disposition of beneficent conceptions. If, therefore, the originator of such a conception wishes to renounce in whole or in part every substantial and direct financial gain . . . the University will consider joining him or her in the effective renunciation of all such rewards to either of them.⁵⁵

2. Focus on Licensing

Again, according to Litan, Mitchell, and Reedy, the technology office's focus on revenue maximization reduces the incentives to employ other means of transferring knowledge, such as publications, conferences, and informal exchanges.⁵⁶ If faculty owned their own inventions, on the other hand, they would have the ability to place their inventions in the public domain if they believed that was the best way to transfer the technology to the public.⁵⁷ Martin Kenney and Donald Patton similarly contend that if an inventor wants to create a start-up to commercialize an invention, the technology transfer office becomes an unnecessary middleman in the process.⁵⁸ In their view, if the inventor initially has rights to the invention, and using the technology transfer office to license the technology is the most efficient outcome, then the inventor can still use the office, but if the system is set up such that rights automatically vest in the university, the inventor does not make the decision.⁵⁹ Moreover, if an inventor does want to form a start-up to commercialize the invention, the university's interest in maximizing revenues creates an incentive to pursue immediate licensing instead. Typically, licensing inventions to large companies is less risky and results in more immediate financial gain. Thus, it is claimed, universities often needlessly steer faculty inventors toward licensing instead of other goals.⁶⁰

It is unclear whether these authors' concerns have been borne out in practice. AUTM's 2012 Licensing Survey showed that there were 705 faculty-related start-ups formed in 2012, which was an increase of 5% from 2011.⁶¹ Since the number of licenses executed also increased by 5% from 2011 to 2012, the number of start-up companies being formed as a result of faculty inventions is increasing at about the same rate—suggesting that technology transfer offices are supporting faculty start-ups with comparable enthusiasm as issuing licenses on such inventions to industry.

55. *Appendix D—Statement of Policy on Proprietary Rights in the Intellectual Products of Faculty Activity, Paragraph G: Licensing; Authorization To Use; Renunciation of Gain*, COLUM. U., <http://www.columbia.edu/cu/vpaa/handbook/appendixd.html> [<https://perma.cc/NN3D-ZNKB>] (last revised Nov. 2008).

56. *See* Litan et al., *supra* note 48, at 44.

57. *See* Martin Kenney & Donald Patton, *Reconsidering the Bayh-Dole Act and the Current University Invention Ownership Model*, 38 RES. POL'Y 1407, 1414 (2009).

58. *Id.* at 1411.

59. *Id.* at 1414–16.

60. *Id.* at 1412–13.

61. ASS'N OF UNIV. TECH. MANAGERS, AUTM U.S. LICENSING ACTIVITY SURVEY FY2012 HIGHLIGHTS 2 (2013), *available at* <http://www.autm.net/resources-surveys/research-reports-databases/licensing-surveys/archived-licensing-surveys/> [<https://perma.cc/L5GS-PGA6>].

B. Are Faculty Members in the Best Position To License Their Own Inventions?

Critics of the current institutional ownership default rule also maintain that the faculty member who works in the field in which he invents would typically have the best contacts to pursue licensing. Litan, Mitchell, and Reedy state that the faculty member knows whom to contact and is more familiar with the overall process than any university official.⁶² Similarly, Kenney and Patton point out that the technology licensing office deals in so many different types of inventions that it inherently cannot be as familiar with the field of any one invention as the inventor.⁶³ Faculty members presumably know the scope and potential of the invention and are better able “to ensure the invention’s proper development from an abstract idea to its practical application.”⁶⁴

While it is certainly the case that faculty members have good contacts in their fields and are often an invaluable resource for the process of commercialization, the critics have presented no evidence that faculty are better able to negotiate the commercialization of their inventions than more experienced university negotiators. Indeed, a principal function of university technology transfer offices is to negotiate the terms of commercialization of faculty inventions. Individual faculty members, on the other hand, spend most of their time teaching, researching, and performing the creative work behind inventions, none of which would suggest any particular business acumen for negotiating a favorable deal. As a 2010 National Research Council study observed, “there is no systematically collected evidence that inventors have knowledge and skills superior to those of technology transfer personnel and their service providers in the various components of IP acquisition, management, and licensing.”⁶⁵

In fact, given that many faculty members have preexisting relationships with industry, such as consulting arrangements, some faculty members might simply choose a company with which they are already consulting for commercialization, even if that company is not actually in the best position to do so.

Thus, there is no evidence at present that faculty ownership would result in more effective commercialization, and there is reason to believe faculty ownership may actually result in less effective commercialization where preexisting relationships will dominate the faculty member’s considerations.

C. Do University Technology Transfer Offices Slow Down the Commercialization Process?

In a 2010 article, Robert E. Litan and Lesa Mitchell argue that university technology transfer offices actually slow down commercialization of inventions and

62. See Litan et al., *supra* note 48, at 48–49.

63. Kenney & Patton, *supra* note 57, at 1411.

64. Chew, *supra* note 12, at 310.

65. NAT’L RESEARCH COUNCIL OF THE NAT’L ACADS., *MANAGING UNIVERSITY INTELLECTUAL PROPERTY IN THE PUBLIC INTEREST* 51 (Stephen A. Merrill & Anne-Marie Mazza eds., 2011).

create a bottleneck in the process.⁶⁶ Due to the “monopolistic model” that requires faculty members to go through the technology transfer office in all instances, these offices are underperforming; Litan and Mitchell point to the example of output decline in FDA-approved drugs.⁶⁷ A better approach, in their view, would be amendments to Bayh-Dole to require that faculty members be allowed to choose their own licensing agents in order for a university to receive federal funding.⁶⁸ In an earlier piece, Litan, Mitchell, and Reedy discussed findings that the average commercialization speed, from discovery to licensing, was about four years, which they viewed as too long.⁶⁹ They argued that accelerating the pace of commercialization would provide more benefit to everyone.⁷⁰

These assertions are problematic on a number of grounds. First, it is not clear the results would be materially different were faculty able to choose their own licensing agents. Indeed, left on their own, they are most likely to choose their own university technology transfer offices. Litan, Mitchell, and Reedy themselves acknowledge that even though the Wisconsin Alumni Research Foundation (WARF), the independent research body at the University of Wisconsin, allows individual faculty members to patent their own inventions (unless federal funding is involved), nearly all faculty inventors go through WARF because of its expertise.⁷¹ In addition, technology transfer offices provide an important risk-spreading and social-utility-maximizing function. Only a small fraction of inventions are licensed, and only a few licensed inventions make any significant profit. As a result, while a few technology transfer offices see significant revenues from “blockbuster” inventions, others who are unable to cover the cost of their own office operations are considered underperformers.⁷² Since many inventions do not have the potential to yield a large licensing profit, a non-university technology transfer office would likely not be interested in most faculty inventions that university technology transfer offices support. Thus, “privatizing” these offices and allowing faculty members to choose which one to go to could ultimately result in worse outcomes for faculty members who do not have inventions that can be readily commercialized. This suggests that, at least where technology transfer offices are competent, allowing faculty to choose their own licensing agent would result in very few changes to the current process.

66. Robert E. Litan & Lesa Mitchell, *A Faster Path from Lab to Market*, HARV. BUS. REV., Jan.–Feb. 2010, at 52.

67. *Id.* at 53.

68. *Id.* at 53.

69. *See* Litan et al., *supra* note 48, at 46.

70. *See id.*

71. *Id.* at 50.

72. NAT'L RESEARCH COUNCIL OF THE NAT'L ACADS., *supra* note 65, at 46, 79–80. One example of this kind of service-oriented work performed by technology transfer offices is the “open-door coaching” provided by M.I.T.'s Technology Licensing Office (TLO), where M.I.T. mentors students interested in starting a business, regardless of whether they will use TLO technology. EDWARD B. ROBERTS & CHARLES EESLEY, M.I.T. SLOAN SCH. OF MGMT., *ENTREPRENEURIAL IMPACT: THE ROLE OF MIT* 58 (2009), available at https://entrepreneurship.mit.edu/sites/default/files/documents/Entrepreneurial_Impact_The_Role_of_MIT.pdf [<https://perma.cc/5EWS-MUG5>].

Second, it is questionable whether the speed of commercialization metric adopted by Litan, Mitchell, and Reedy is a reliable measure of the performance of technology transfer offices. The metric considers the time from the filing of an initial patent, which often happens very early in the research process, to commercialization. However, further academic research is often needed before an invention can be commercialized, and this timeline is outside the control of the technology transfer office. Pushing to license and commercialize an invention that is not yet ripe would be counterproductive. In fact, identifying the appropriate point to begin the commercialization process is an important function of technology transfer offices.⁷³ Therefore, the Litan, Mitchell, and Reedy metric both includes significant factors outside the control of technology transfer offices and, if pushed as a performance measure, could create incentives for counterproductive behavior.

Finally, even if speeding up the process of commercialization were a worthwhile goal, faculty ownership is likely not to be the most effective way to accelerate the process. Individual faculty members spend most of their time teaching and researching and typically have no particularly well-developed skills for negotiating licensing or other commercialization deals, making it questionable (at best) whether granting them ownership would help spur commercialization. A better approach may be to allow universities with effective technology transfer programs, such as the University of Wisconsin's WARF program, to continue to pursue licensure, and allow other universities with less well-developed programs to pool resources in order to more effectively and more quickly transfer new technologies. This concept is discussed in more detail later in this Article.

D. Does University Ownership Distort the Direction of Academic Research?

Chew argues that because owning inventions creates incentives for universities to direct faculty toward more profitable research areas, university ownership undermines university policies of protecting academic freedom.⁷⁴ The effect is university pressure on faculty researchers to pursue applied rather than basic research, and in general, to pursue work that is more likely to result in profits.⁷⁵ This shift to applied research is problematic because the vast preponderance of basic research is done in universities and such basic research lays the foundation for applied research.⁷⁶

The available evidence does not, however, support the concern that the prospect of commercialization has caused a fundamental shift in academic research interests. A committee asked by the Board on Science, Technology, and Economic Policy (STEP), a unit of the National Academies of Science, Technology, and Medicine, to study the effect of the Bayh-Dole Act on university technology transfer considered

73. See, e.g., TECH. LICENSING OFFICE, MASS. INST. OF TECH., AN INVENTOR'S GUIDE TO TECHNOLOGY TRANSFER AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY 4 (2010), available at http://tlo.mit.edu/sites/default/files/documents/MITInventGd_V5%204-7-2010.pdf [<https://perma.cc/5C5L-EUNB>] (discussing how one of the key steps in the TLO's processes is assessing whether the invention is ready for commercialization).

74. See Chew, *supra* note 12, at 305–06.

75. See *id.* at 306.

76. *Id.* at 308.

whether efforts to commercialize inventions have resulted in faculty diversion from basic research.⁷⁷ The STEP committee found that “studies using different methodologies have not found an appreciable change in the orientation of research, even on the part of faculty members already active in commercialization efforts.”⁷⁸

E. Will Faculty Ownership Lead to More and Better Inventions?

Would more inventions be created if faculty owned the rights to their own inventions?⁷⁹ One study points to the following evidence: (1) when the University of California increased the royalty rate provided to professors, the number of invention disclosures went up; and (2) among the universities with the greatest number of patents awarded in 1988 were universities that at that time allowed faculty to retain ownership over their own inventions (Stanford, Harvard, and the University of Wisconsin).⁸⁰ However, this study may suffer from multiple confounding factors. First, the University of California was making significant overall changes to its technology transfer office at the time. Second, many of these patents were filed near the enactment of Bayh-Dole, which itself produced a large change in the field. Third, the number of patents awarded at the time of the study was primarily a function of the size of university patent budgets, which were very low at most universities.⁸¹

It is therefore difficult to say, without more work, whether the mentioned universities received more patents because of their reputation and the caliber of their researchers, or because of the ownership rule they adopted. Moreover, the STEP committee that examined university technology transfer in light of Bayh-Dole pointed to other studies concluding that faculty overall have engaged in more research as a result of involvement with university technology transfer offices.⁸² Data from AUTM similarly show that the number of invention disclosures continues to increase,⁸³ suggesting that the system is providing sufficient incentives to faculty for research and invention.

We are not opposed per se to higher royalty payments for faculty inventors or even university policies that allow faculty to retain ownership. The question is whether the general default rule for the system should be faculty ownership rather than the current approach, which facilitates the university’s role as overall coordinator of the invention promotion and commercialization process. It may well be the case that giving faculty a higher percentage of earnings on their inventions

77. NAT’L RESEARCH COUNCIL OF THE NAT’L ACADS., *supra* note 65.

78. *Id.* at 35–36.

79. *See* Kulkarni, *supra* note 12, at 250–52.

80. *Id.* at 251.

81. For example, legal fees spent on patenting have increased by over five times since the early 1990s, according to data from AUTM. ASS’N OF UNIV. TECH. MANAGERS, FY 2012 U.S. LICENSING ACTIVITY SURVEY (2013) [hereinafter AUTM], *available at* <http://www.autm.net/resources-surveys/research-reports-databases/licensing-surveys/archived-licensing-surveys/> [<https://perma.cc/3PXX-7MTP>] (based on analysis of AUTM survey data; available upon request).

82. NAT’L RESEARCH COUNCIL OF THE NAT’L ACADS., *supra* note 65, at 35.

83. ASS’N OF UNIV. TECH. MANAGERS, *supra* note 61, at 3 (showing 8.6% increase in invention disclosures from 2011 to 2012).

could promote more inventions; this is something universities should continue to consider under current arrangements. We note also that most faculty at the University of Wisconsin still go through WARF for commercialization of their inventions anyway, suggesting that it is not the policy but the university's reputation and technology transfer efforts that have promoted this increased level of invention.

F. Will Faculty Ownership Help Universities Retain Faculty?

Kulkarni argues that allowing professors to own their own IP will help universities retain talented faculty.⁸⁴ He posits that private companies, particularly in the science and engineering fields, compete for talented faculty and can offer them greater financial rewards.⁸⁵ Thus, allowing faculty to retain ownership over their own inventions will help universities to retain their talent.

Compensation is indeed an important motivator. It is unclear, however, whether private-industry employment is likely to appeal to faculty researchers regardless of whether they have the rights in their own inventions. Many faculty members prefer the world of academia because of the potential for exploring broad types of research that may be more limited at a private company. Moreover, if a faculty member did work for a private company, the company would almost certainly require the individual to sign away rights to ownership of any inventions to the company. The faculty member would have no option to patent the invention and license it to a different company that is likely to more effectively transfer it to the public. Thus, a faculty member particularly concerned about owning his or her own inventions is likely to be worse off working for a private company than working for a university.

Of course, unhappy faculty may go to other universities. Kulkarni cites the example of one faculty member of Caltech, Stephen Wolfram, who wanted to retain the copyright over a computer program he designed.⁸⁶ Caltech insisted that it owned the copyright, and as a result, Wolfram left for another university that offered him rights in any computer programs he created.⁸⁷ Thereafter, he created a more advanced version of his original creation, and his new university received accolades as a result of Wolfram's creation of this software while he was working there.⁸⁸

Under the current institutional ownership default rule, universities have to decide whether they are better off, in terms of faculty recruitment and retention, in allowing faculty to retain ownership rights in inventions. Some universities, such as the University of Wisconsin and Stanford, have in fact adopted more flexible policies in recognition of faculty desires.⁸⁹ It is not clear, however, that changing the default rule is necessary to enable universities to take the steps needed to attract and retain desired faculty.

84. Kulkarni, *supra* note 12, at 248–50.

85. *Id.* at 248.

86. *Id.* at 249–50.

87. *Id.*

88. *Id.* at 250.

89. *See supra* text accompanying notes 40–43.

IV. INSUFFICIENT CASE FOR CHANGE

In our view, the arguments in favor of a new default rule of faculty ownership of inventions are insufficiently developed and fail to provide adequate justification for such a change. Accordingly, the STEP committee that most recently considered this issue found that the current system is much better than the prior system of government ownership of federally funded inventions.⁹⁰ The committee further found that there is insufficient evidence to date that a faculty ownership system would work better than the institutional ownership default rule, and that significantly more empirical and policy evidence would need to be presented in order to justify making a change.⁹¹ In our view, this conclusion is justified for a number of reasons.

A. Universities Own Faculty Inventions as Part of a Mission To Advance Faculty Research and the Common Good As Coordinator of a Team Production Process

Contrary to the claims of many critics, university IP and technology transfer policies frequently emphasize their goals of enhancing the public good through research and/or technology transfer. For example, Harvard University's Statement of Policy in Regard to Intellectual Property applauds Harvard's "long history of benefiting the public through its research programs."⁹² Similarly, Stanford University's Office of Technology Licensing states that its mission is "to promote the transfer of Stanford University technology for society's use and benefit."⁹³

Further, in most instances, faculty inventions are created pursuant to a group effort involving the work of other university personnel and, of course, university-provided resources. The inventions are the product of this team production process. Typically, universities require faculty members to assign ownership rights over inventions that were created or reduced to practice with significant use of university resources or funding. Though some policies avowedly claim ownership even over inventions that are merely developed within the scope of the faculty member's employment, it is likely that even those inventions make use of university resources in some significant way. Much would depend on the particular facts. Faculty research that does not depend on the work of other university personnel or significant university resources is not likely to be the subject of a university technology transfer effort. The stated terms of the policy may be overbroad in such cases, but a university is not likely to assert a claim in those circumstances and, if it did, would invite *Speck*-type litigation over whether the faculty member was hired to create the particular invention.

As a corollary of the team production model, we should expect that the net royalties generated from faculty inventions largely go to the faculty member and further research efforts in the faculty member's department/school.⁹⁴ The university

90. See NAT'L RESEARCH COUNCIL OF THE NAT'L ACADS., *supra* note 65, at 62–66.

91. *Id.* at 64–66.

92. HARVARD UNIV., *supra* note 13, Introduction.

93. *OTL and the Inventor: Roles in Technology Transfer*, STAN. U. OFF. TECH. LICENSING, http://otl.stanford.edu/inventors/resources/inventors_otlandinvent.html [https://perma.cc/NXU6-KV54].

94. See *supra* note 46 and accompanying text (giving examples of royalty distributions at various schools).

itself typically takes a part of the gross royalties to cover its costs and a minimal share of the net royalties (and even in the cases where the central university takes a significant percentage of income for a very successful invention, that money still must be used only for “research and education”).⁹⁵ Thus, even though the university retains ownership of the invention in order to facilitate the commercialization process, the revenue from such commercialization primarily goes to fund further research efforts.

It is unclear why individual faculty members would object to this type of system, particularly where they would likely have difficulty bearing on their own the costs of seeking patent protection and/or commercialization on their own, and where nearly all of the revenues of current arrangements flow to the individual faculty members or to additional research efforts by the faculty members or their departments. These points suggest that a default rule of faculty ownership would, in nearly all cases, lead to an assignment back to the university.

B. Potential for Conflicts of Interest

A faculty-ownership default rule may also engender serious conflicts of interest. Many faculty members engage in outside consulting arrangements with private industry. Though most university policies place some limits on the amount of time faculty can spend in outside consulting,⁹⁶ without university protection of IP

95. *Id.*

96. JULIA MCCALLIN, CAL. INST. OF TECH., STAFF PERSONNEL MEMO NO. 9-3, OUTSIDE ACTIVITIES (2016), available at <https://hr.caltech.edu/documents/9-pm09-3.pdf> [<https://perma.cc/8SH9-DMVW>]; N.Y. UNIV., NYU POLICY ON ACADEMIC CONFLICT OF INTEREST AND CONFLICT OF COMMITMENT §§ III.B.2, V (2013), available at <http://www.nyu.edu/content/dam/nyu/compliance/documents/AcademicCOI.2013.pdf> [<https://perma.cc/PR97-62MT>] (cannot spend, on average, more than 1 day per week and must disclose all consulting arrangements); UNIV. OF CAL., GUIDANCE FOR FACULTY AND OTHER ACADEMIC EMPLOYEES ON ISSUES RELATED TO INTELLECTUAL PROPERTY AND CONSULTING 3–4 (2003), available at http://www.ucop.edu/research-policy-analysis-coordination/_files/Consulting-Industry-White-Paper-2003.pdf [<https://perma.cc/TA9D-DWM4>] (39 days during year for faculty on 9-month appointment; 48 days per year for faculty on fiscal-year appointment; yearly reporting required for both); YALE UNIV., ADVICE TO YALE FACULTY CONCERNING EXTERNAL CONSULTING ACTIVITIES 1 (2009), available at <http://ocr.yale.edu/sites/default/files/files/ConsultingGuidance.pdf> [<https://perma.cc/6666-2Q9W>] (consulting permitted but only for 1 day per 7-day week during academic year); *Appendix F—Columbia University Guidelines for Situations Involving Potential Conflict of Interest Between Scholarly and Commercial Activities, B. Establishing General Principles*, COLUM. U., <http://www.columbia.edu/cu/vpaa/handbook/appendixf.html> [<https://perma.cc/RLP8-CPNG>] (last revised Nov. 2008) (can engage in outside activities 1 day per week as long as they don’t conflict with university responsibilities or mission); *Guidelines for Extramural Activities, Associations and Interest for Staff*, PENN HUM. RESOURCES, <https://www.hr.upenn.edu/myhr/resources/policy/other/guidelines-for-extramural-activities-associations-and-interest-for-staff> [<https://perma.cc/HZN8-REE3>] (effective Mar. 31, 2010) (consulting arrangements that may pose a conflict of interest must be approved); *Policy HR80 Private Consulting Practice*, PENN ST. U. POL’Y MANUAL, <http://guru.psu.edu/policies/ohr/hr80.html> [<https://perma.cc/P52V-SL9P>] (effective July 1, 2013) (typically permitted to engage in outside consulting 4 days per month or 40 hours per

generated within the scope of their university employment, individual faculty members may be inclined to assign rights in all of their inventions to companies they are consulting with. Even if the faculty member develops an invention completely on university time and with the use of university personnel and resources, these faculty researchers may be motivated to grant patent rights and/or an exclusive license to a company with which they have a preexisting relationship with, even if that is not the best outcome for commercialization of the invention.

With university ownership of inventions generated within the scope of university employment and subsequent commercialization of the invention, the university can ensure that any company given a license in the invention is the best choice for commercialization and that the faculty member has no inappropriate conflicts with such a company.

*C. Fragmenting Ownership Among Multiple Faculty Members
Will Complicate Licensing*

As the number of joint owners of a piece of property increases, the transaction costs associated with transferring ownership or otherwise deciding how to use the property increase.⁹⁷ Therefore, having multiple faculty members jointly own a patent will typically result in higher transaction costs than when the university is the sole owner. Multiple ownership could similarly result in the different owners being unable to agree on the proper way to commercialize an invention and could lead to a delay in commercialization, or in the worst-case scenario, failure to commercialize at all.

Similarly, having a technology transfer office as a single owner of many patents will reduce average transaction costs compared with ownership of the patents being dispersed throughout the faculty, even if individual patents were each owned by just one faculty member. It also would alleviate potential issues associated with multiple owners failing to agree on the best way to commercialize. These issues become more significant in light of the fact that a patent having multiple inventors is becoming the norm. For example, a sample we gathered of 152 recent patents listing M.I.T. as the

month and must seek approval); *Statement on Outside Activities of Holders of Academic Appointments*, HARV. U. OFF. PROVOST, <http://provost.harvard.edu/statement-outside-activities-holders-academic-appointments> [https://perma.cc/CF2G-5KWB] (last updated 2016) (cannot spend more than 20% of time on outside activities); *4.0 Faculty Rights and Responsibilities*, *4.5 Outside Professional Activities*, MIT POL'YS & PROCS., <http://web.mit.edu/policies/4/4.5.html> [https://perma.cc/Y8BL-PUX3] (must disclose all outside commitments to M.I.T.); *4.3 Consulting and Other Outside Professional Activities by Members of the Academic Council and Medical Center Line Faculty*, STAN. U., <https://doresearch.stanford.edu/policies/research-policy-handbook/conflicts-commitment-and-interest/consulting-and-other-outside-professional-activities-members-academic-council-and-medical-center-line-faculty> [https://perma.cc/CYA9-3MCS] (last revised Aug. 22, 2012) (must be preapproved in certain circumstances and only up to 13 days per quarter, with some averaging permitted with permission, up to 39 days per year).

97. See, e.g., Norbert Schulz, Francesco Parisi & Ben Depoorter, *Fragmentation in Property: Towards a General Model*, 158 J. INSTITUTIONAL & THEORETICAL ECON. 594 (2002).

assignee showed that 41% had four or more inventors.⁹⁸ Less than 10% had just one inventor.⁹⁹ One patent actually had twelve inventors.¹⁰⁰

D. Difficulty with Bayh-Dole Compliance

As the STEP committee considering Bayh-Dole Act compliance concluded:

Compliance with the Bayh-Dole Act's limitations and conditions on publicly funded inventions, including the requirement that a share of any resulting revenue be directed back into support of research, may be harder to monitor and achieve from individual inventors than from research institutions accustomed to ensuring compliance with the variety of federal requirements associated with research funding.¹⁰¹

Thus, if Bayh-Dole were amended to mandate faculty inventor ownership, such a change might further complicate the process of monitoring whether the monies generated from licensing such inventions are being funneled back into federal research, which is a significant goal of Bayh-Dole.

Changing the default rule from university ownership to faculty ownership would, importantly, require amending Bayh-Dole itself. The National Institutes of Health, which funds nearly \$26 billion per year in university research,¹⁰² requires that recipients of its funding secure assignments of rights in any inventions from their employees and further provides that a failure to do so may lead to a loss in funding.¹⁰³ Although it would theoretically be possible to secure such assignments only for specific projects under federal funding, given the sheer number of research projects at universities that involve some degree of federal funding, this may be practically impossible.

E. Allowing the Possibility of Faculty Ownership Would Likely Not Change the Overall Result

There are at least two sources of data suggesting that allowing faculty to avoid disclosing their inventions to the university and/or retain ownership of their inventions would not actually change current outcomes. First, data from AUTM

98. We analyzed 152 patents with M.I.T. as an assignee filed between December 24, 2013 and June 17, 2014. Data and analysis available upon request. Patents Assigned to M.I.T. from Dec. 24, 2013 to June 17, 2014, USPTO PATENT FULL-TEXT AND IMAGE DATABASE, <http://patft.uspto.gov/netahtml/PTO/search-adv.htm> [<https://perma.cc/QZ27-BUTM>] (search "AN/(Massachusetts AND Institute AND Technology) and ISD/(12/24/2013->6/17/2014)"). We are grateful to David Yin for this analysis.

99. *See id.*

100. *See id.*

101. NAT'L RESEARCH COUNCIL OF THE NAT'L ACADS., *supra* note 65, at 65.

102. *See Budget*, NAT'L INSTS. HEALTH, <http://www.nih.gov/about-nih/what-we-do/budget> [<https://perma.cc/RH3H-LF26>] (last updated Feb. 16, 2016).

103. NAT'L INSTS. OF HEALTH, U.S. DEP'T OF HEALTH & HUMAN SERVS., NIH GRANTS POLICY STATEMENT § 8.2.4 (2013), *available at* http://grants.nih.gov/grants/policy/nihgps_2013/nihgps_2013.pdf [<https://perma.cc/N2FY-7EVC>].

show that the rate of disclosures at Stanford and the University of Wisconsin, universities where faculty have the ability to commercialize their invention on their own and/or retain ownership, are comparable to those at other similar universities that require faculty assignment of inventions. The number of inventions disclosed per year per billion dollars in total research funding measures how productively these universities use their available resources. The most recent data show WARF producing 401 disclosures per billion and Stanford producing 625, compared to a peer average of 506. In other words, WARF is 21% less productive than average while Stanford is 24% more productive than average. There is thus no apparent link between WARF and Stanford's policies and the rate of invention disclosures. The pertinent data is contained in Table 1 below.

Table 1. Average number of disclosures per billion dollars in total funding by five-year period at leading research universities¹⁰⁴

	1993–1997	2006–2010
Stanford University	515	625
University of Wisconsin*	443	401
Massachusetts Institute of Technology	604	391
Columbia University**	514	496
California Institute of Technology	2018	1193
New York University***	358	388
University of Pennsylvania	467	466
Pennsylvania State University	414	186
Harvard University	324	403
<i>Peer Average</i>	629	506

*Data for 2006 and 2009–10 is missing.

**Data for 2006 is missing.

***Data for 1993–95 is missing.

Second, at most universities, a very large percentage of research is federally funded,¹⁰⁵ and thus the university will retain ownership for purposes of ensuring Bayh-Dole compliance, regardless of whether faculty generally have initial ownership rights.

F. Trend Toward Worldwide Replication of U.S. System

Due in large part to the success of commercializing inventions that the United States has achieved since Bayh-Dole, many other countries have sought to pass legislation similar to Bayh-Dole.¹⁰⁶ In Europe, where the faculty ownership model

104. AUTM, *supra* note 81 (based on analysis of AUTM survey data; available upon request).

105. Our survey of patents filed at M.I.T in the first half of 2014 shows that approximately 60% were developed using federal funding.

106. Dov Greenbaum, *Academia to Industry Technology Transfer: An Alternative to the Bayh-Dole System for Both Developed and Developing Nations*, 19 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 311, 316–17 (2009).

had been prevalent up until the 1990s, all countries except Sweden have now moved to the institutional ownership model.¹⁰⁷

Indeed, according to data from AUTM, university innovation under the Bayh-Dole regime has resulted in over 5000 licenses being granted and \$2.6 billion in license revenue in 2012 alone.¹⁰⁸ The number of licenses continues to increase, with a 5.4% increase over the previous year.¹⁰⁹ Moreover, the total number of invention disclosures also continues to increase, 8.6% from 2011 to 2012, suggesting that the current system is resulting in more inventions and more licensing—and thus increased commercialization.¹¹⁰

CONCLUSION AND POTENTIAL IMPROVEMENTS

Despite our conclusion that insufficient evidence of the need to make a wholesale change to the current system of university ownership of faculty inventions has been presented, there certainly is room for improvement of the technology transfer process, as many critics have suggested. Such improvements could include adoption of “best practices” by universities for technology transfer, and/or potential pooling of resources at universities with smaller technology transfer offices.

AUTM has begun the process of improving technology transfer through dissemination of its Nine Points document, which provides excellent points for universities to consider in developing technology transfer policies. Nonetheless, there is more that can be done to address some of the concerns laid out above. For example, the Nine Points and government funding agencies could further emphasize the need for universities to expend efforts to commercialize socially beneficial inventions.

In addressing concerns related to potential inefficiencies associated with technology transfer offices, one option would be for technology transfer offices, particularly at smaller universities, to merge in order to provide economies of scale in commercialization efforts. These offices could be regional in scope, as proposed by Dov Greenbaum in a 2009 piece.¹¹¹ Greenbaum suggests that such an office would be able to review more invention disclosures more effectively, and since it would not be serving a particular school, may be more objective in assessing the value of a patent.¹¹² Further, because the office would be larger, it could more effectively develop expertise.¹¹³

A related approach would be to establish, as the University of Wisconsin has done, independent organizations whose sole mission would be to handle IP and technology transfer for universities. The organizations could be set up in such a way that they would receive a flat payment regardless of how much revenue an invention brought

107. Vicki Loise & Ashley J. Stevens, *The Bayh-Dole Act Turns 30*, LES NOUVELLES, Dec. 2010, at 185, 187.

108. AUTM, *supra* note 81.

109. ASS’N OF UNIV. TECH. MANAGERS, *supra* note 61, at 4.

110. *Id.* at 3.

111. Greenbaum, *supra* note 106, at 381.

112. *Id.* at 382.

113. *Id.*

in, and other controls could be put in place to alleviate some of the concerns related to socially beneficial inventions not being commercialized raised by the critics.

The overall institutional ownership system is generally working well. The case has not yet been made for changing the default rule to faculty ownership of inventions developed in the course of university employment.