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University Inventions Reconsidered: Debunking the Myth of University Ownership

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UNIVERSITY INVENTIONS RECONSIDERED: DEBUNKING THE MYTH OF UNIVERSITY OWNERSHIP

PATRICIA E. CAMPBELL*

ABSTRACT

Most universities today assert ownership rights over all patentable inventions (and many other types of intellectual property) created by members of the university community, including faculty, staff, students, visitors, and others. Universities then attempt to license that intellectual property (IP) to third parties, in order to generate revenue for the university and to give the public the benefit of innovations developed by the institution, often with the use of federal funds. This Article provides an evaluation of the technology transfer policies and practices of U.S. universities. Part I surveys the IP policies of a representative group of universities, showing that most universities claim outright ownership of the invention rights of most members of the university community, while a few require present or future assignment of such rights to the university. Part II reviews the history of IP ownership and demonstrates that claims to ownership of university inventions evolved slowly over the course of the last 100 years, beginning with inventor ownership as the accepted model and culminating in the passage of the Bayh-Dole Act in 1980 and subsequent case law. Parts III and IV provide two proposals for addressing problems in the current ownership and technology transfer model. One is a more “modest” proposal that could be implemented immediately by universities to bring their IP policies and agreements into line with relevant laws; the other is a long-term proposal for discussion and substantial change in which university inventors would have an option to retain ownership of their inventions, and universities could assume more natural and supportive roles as educators and facilitators.

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INTRODUCTION

Alexander Graham Bell was a professor at Boston University's School of Oratory from 1874 to 1879.¹ In addition to his teaching responsibilities, Bell was conducting research on a "harmonic telegraph," which transmitted multiple messages over a single wire at one time using different tones.² In 1875, relying on a one-year advance on his teaching salary, he began working on an expanded version of his invention which would transmit the human voice.³ Bell invented the telephone, and on March 7, 1876, he received his first patent, U.S. Patent No. 174,465.⁴ Bell's telephone patents have sometimes been characterized as "the most valuable patents ever issued."⁵ Bell owned the patents himself and was not required to share ownership, control, or profits with Boston University.⁶ The Bell Telephone Company was founded in 1877, and in 1899, American Telephone and Telegraph (AT&T) became the parent company of Bell Telephone.⁷ Bell ultimately brought (and won) numerous lawsuits against defendants who allegedly infringed on his telephone patents.⁸

In today's world, a very different outcome might result.⁹ The university would likely have claimed ownership of the invention, and Bell would have been required to assign any resulting patents to the university.¹⁰ The university's technology transfer office would then have attempted to find a licensee to commercialize

¹ Brian Fitzgerald, *Alexander Graham Bell: The BU Years*, 5 B.U. BRIDGE (Sept. 2001), <https://www.bu.edu/bridge/archive/2001/09-14/bell.html> [<https://perma.cc/Y36T-MZL7>].

² *Id.*

³ ROBERT BRUCE, *ALEXANDER GRAHAM BELL AND THE CONQUEST OF SOLITUDE* 143 (Little, Brown and Company, 1973).

⁴ *Id.* at 174.

⁵ *Id.* at 176.

⁶ See Vicki Loise & Ashley J. Stevens, *The Bayh-Dole Act Turns 30*, SCI. TRANSLATIONAL MED. 1 (Oct. 6, 2010), <https://stm.sciencemag.org/content/sci/transmed/2/52/52cm27.full.pdf> [<https://perma.cc/E8V9-JSTY>].

⁷ See BRUCE, *supra* note 3, at 231, 293; *AT&T's History of Invention and Breakups*, N.Y. TIMES (Feb. 13, 2016), <https://www.nytimes.com/interactive/2016/02/12/technology/att-history.html> [<https://perma.cc/HZ4W-DK7D>].

⁸ See, e.g., *Dolbear v. Am. Bell Tel. Co.*, 126 U.S. 1, 1 (1888).

⁹ See generally Loise & Stevens, *supra* note 6.

¹⁰ *Id.*

the invention.¹¹ In order to maximize revenues, the technology transfer office might have attempted to license Bell's patent to his competitor, Elisha Gray.¹² Alternatively, it might have encouraged Bell to create a startup company that would license his own inventions back from the school, and Bell might have located that startup in a business incubator sponsored by the university.¹³ Bell would receive a share of the royalties his company paid to the university after patenting costs were reimbursed, while any remainder would have been used to support other research and development efforts at the school.¹⁴ As the owner of the patents, the university would probably have been required to participate in the infringement suits Bell brought against his competitors, which the university might have been reluctant to do.¹⁵

This Article provides an evaluation of the technology transfer policies and practices of U.S. universities today. Part I surveys the intellectual property (IP) policies of a representative group of universities, showing that most universities claim outright ownership of the invention rights of most members of the university community, while a few require present or future assignment of such rights to the university. Part II reviews the history of IP ownership and demonstrates that claims to ownership of university inventions evolved slowly over the course of the last 100 years, beginning with inventor ownership as the accepted model and culminating in the passage of the Bayh-Dole Act in 1980 and subsequent case law. Parts III and IV provide two proposals for addressing problems in the current ownership and technology transfer model. One is a more "modest" proposal that could be implemented immediately by universities to bring their IP policies and agreements into line with relevant laws; the other is a

¹¹ *Id.* at 2.

¹² See JOHN E. NATHAN, FISH & NEAVE, LEADERS IN THE LAW OF IDEAS 16–17 (Newcomen Society of the United States 1997) (The Western Union Telegraph Company was offered the opportunity to acquire the 465 patent in 1876 for \$100,000. Western Union declined, declaring the telephone to be an "ungainly and impractical device" and calling Bell's idea of installing a telephone in every house and business "idiotic on the face of it.").

¹³ Loise & Stevens, *supra* note 6, at 2–3.

¹⁴ Brian J. Love, *Do University Patents Pay Off? Evidence from a Survey of University Inventors in Computer Science and Electrical Engineering*, 16 YALE J.L. & TECH. 285, 311 (2014).

¹⁵ *Id.* at 289–90.

long-term proposal for discussion and substantial change, where university inventors would have an option to retain ownership of their inventions, and universities could assume more natural and supportive roles as educators and facilitators.

I. UNIVERSITY INTELLECTUAL PROPERTY POLICIES MAKE BROAD OWNERSHIP CLAIMS

Most universities today assert ownership rights over all patentable inventions (and many other types of intellectual property) created by members of the university community.¹⁶ The ownership claims encompass not only inventions made by faculty and staff members but frequently also extend to graduate and professional students, undergraduates, visitors, professionals in residence, and others.¹⁷ While some ownership assertions may be included in employment agreements signed by members of the faculty and staff, in many instances these claims are simply included in an obscure Intellectual Property Policy or a faculty handbook that is posted on the university's website.¹⁸ When they commence employment or register for classes, members of the university community may not even be aware that the university has an Intellectual Property Policy and do not understand that they may not own inventions and research they create while they are associated with the university.¹⁹

Some IP policies simply contain a blanket claim to ownership of inventions, while others include a present assignment of all inventions created in the future or an obligation to assign future inventions after they have come into existence.²⁰ A review of the IP policies of the top thirty U.S. engineering graduate schools²¹

¹⁶ See, e.g., *Statement of Policy in Regard to Intellectual Property § 1(C)*, HARV. UNIV., <https://otd.harvard.edu/faculty-inventors/resources/policies-and-procedures/statement-of-policy-in-regard-to-intellectual-property/> [<https://perma.cc/6A7T-NDY5>].

¹⁷ See, e.g., *id.* at 2.

¹⁸ See, e.g., *id.*

¹⁹ Pat K. Chew, *Faculty-Generated Inventions: Who Owns the Golden Egg?*, 1992 WIS. L. REV. 259, 289 (1992).

²⁰ See, e.g., *American University Patent Policies: A Brief History*, AM. ASS'N OF UNIV. PROFESSORS, <https://www.aaup.org/sites/default/files/files/ShortHistory.pdf> [<https://perma.cc/BN4G-NCFR>].

²¹ *Top Engineering Colleges—2018*, GRADUATESHOTLINE, <https://www.graduateshotline.com/ranks/> [<https://perma.cc/D5E3-YBPD>]. Based on the U.S. News

shows that they vary greatly in the extent to which they claim ownership or require assignment of inventions, as well as in their overall tone and complexity.²² Many university IP policies begin with broad policy statements confirming the university's dedication to teaching, research, and public service.²³ For example, the IP policy of the Texas A&M University System²⁴ includes the following general policy statement:

The system is committed to teaching, inquiry-driven learning and the research associated with it, and public service. Research is one of the most important and rewarding aspects of the educational process, regularly leading to the development of new ideas, discoveries and technologies with the potential to benefit the public at large.

This policy is based on three fundamental principles: enhancing academic freedom, providing a clear pathway for pursuing technology commercialization, and protecting all interested parties. To that end, the purposes of this policy are to:

and World Report rankings for 2018, the top 30 graduate programs in engineering (in alphabetical order) are California Institute of Technology, Carnegie Mellon University, Columbia University, Cornell University, Duke University, Georgia Institute of Technology, Harvard University, Johns Hopkins University, Massachusetts Institute of Technology, North Carolina State University, Northwestern University, Ohio State University, Princeton University, Purdue University–West Lafayette, Rice University, Stanford University, Texas A&M University–College Station, University of California–Berkeley, University of California–Los Angeles, University of California–San Diego, University of California–Santa Barbara, University of Illinois–Urbana-Champaign, University of Maryland–College Park, University of Michigan–Ann Arbor, University of Minnesota–Twin Cities, University of Pennsylvania, University of Southern California, University of Texas–Austin, University of Wisconsin–Madison, University of Washington, and Virginia Tech. *Id.* This group appears to be representative of universities producing substantial amounts of research and potentially patentable inventions.

²² For similar methodologies, see Love, *supra* note 14, at 293; Chew, *supra* note 19, at 274 (discussing the policies of the universities with the twenty largest research expenditures in 1987). Chew's article, published in 1992, suggests that university IP policies were in a transitional stage, with many schools moving in the direction of claiming comprehensive rights in faculty discoveries and creations. *Id.* at 274–75.

²³ See, e.g., *Intellectual Property Management and Commercialization*, THE TEX. A&M UNIV. SYS., <http://policies.tamus.edu/17-01.pdf> [https://perma.cc/NQ76-SY9B].

²⁴ *Id.*

(a) ensure that the commercial development of research results enhances the system's education, research and public service missions;

(b) protect the academic freedom of faculty with respect to publication of their research findings;

(c) foster an entrepreneurial environment through incentives and protections that encourages the creation, discovery, development and rapid transfer of new knowledge for the public benefit;

(d) educate and assist faculty, staff and others in the use of the intellectual property process with respect to their discoveries and inventions; and

(e) establish the principles for determining and protecting the interests of the system, creator and sponsor with respect to discoveries and inventions created by faculty, staff and others in a manner that is equitable to all parties.²⁵

The policy may also recognize that the university plays an important role in local or national economic development.²⁶ Other schools explicitly acknowledge that one purpose of their IP policy is to generate financial resources to support further research.²⁷

²⁵ *Id.* at 1–2; *see also Intellectual Property Policy*, CARNEGIE MELLON UNIV. 2, <https://www.cmu.edu/policies/administrative-and-governance/intellectual-property.html> [<https://perma.cc/S9ZG-AB44>] (“The mission of the university remains the generation and dissemination of knowledge.”); *Intellectual Property Policy, Georgia Inst. of Tech.* 1, <http://www.policylibrary.gatech.edu/print/book/export/html/1728> [<https://perma.cc/73D6-NMF2>] (“The Georgia Institute of Technology (GIT) is dedicated to teaching, research, and the extension of knowledge to the public. Its personnel recognize as two of their major objectives, the production of new knowledge and the dissemination of both old and new knowledge.”); *Rice University Policy No. 333: Patent and Software Policies, Rice Univ.* 1, <https://policy.rice.edu/sites/g/files/bxs1746/f/333.pdf> [<https://perma.cc/7KAW-G747>] (“Rice University is dedicated to teaching, research, and the dissemination of all new knowledge generated within the University community.”); *University of Maryland Intellectual Property Policy*, UNIV. OF MD., C. PARK, 1, <https://president.umd.edu/administration/policies/section-iv-research/iv-320a> [<https://perma.cc/AYF6-CHCG>] (“The primary mission of universities is to advance, preserve, and disseminate knowledge.”).

²⁶ *See, e.g., Faculty Handbook Appendix P: Policies Related to Research (Policies on Inventions, Patents, and Technology Transfer)*, DUKE UNIV. 7, https://provost.duke.edu/sites/all/files/FHB_App_P.pdf [<https://perma.cc/G32F-CAPK>].

²⁷ *See, e.g., Patent Policy*, UNIV. OF CAL. 2, <https://policy.ucop.edu/doc/2500493/PatentPolicy> [<https://perma.cc/GCV5-DXQ4>] (stating that the policy was adopted, in part, “to provide for the use of invention-related income for the further support of research and education”); *University of Maryland Intellectual Property Policy, supra* note 25, at 1 (stating that the policy was established, in part, to “generate resources to support the University’s primary mission.”).

The great majority of IP policies reviewed for this Article affirmatively state that the university “owns” all intellectual property created by members of the university community, at least to the extent that the IP was created in the course of employment or with the use of university resources.²⁸ Many of these policies then

²⁸ See, e.g., *Inventions and Related Property Rights*, CORNELL UNIV. 8, https://www.dfa.cornell.edu/sites/default/files/policy/vol1_5.pdf [https://perma.cc/8KTF-REP4] (inventions “belong to the university”); see also *Faculty Handbook Appendix P: Policies Related to Research (Policies on Inventions, Patents, and Technology Transfer)*, supra note 26 (inventions made on university time or with university resources “shall be considered the property of the university”); *Guide to the Ownership, Distribution and Commercial Development of MIT Technology*, MASS. INST. OF TECH. 6, https://tlo.mit.edu/sites/default/files/MIT-TLO-ownership-guide_0.pdf [https://perma.cc/NQD5-HGAJ] (“Patents, copyrights on software, maskworks, and tangible research property and trademarks developed by faculty, students, staff and others, ... are owned by MIT when either of the following applies.”); *Intellectual Property*, PURDUE UNIV., <https://www.purdue.edu/policies/academic-research-affairs/ia1.html> [https://perma.cc/PLX8-68MG] (“Intellectual Property that arises in any part in the course of employment or enrollment at the University, or in the course of a work-for-hire relationship or visiting scholar relationship with the University, is Purdue Intellectual Property,” except in certain stated situations.); *Intellectual Property Management and Commercialization*, supra note 23, at 2; *Intellectual Property Policy*, THE JOHNS HOPKINS UNIV. 3, https://www.jhu.edu/assets/uploads/2014/09/intellectual_property_policy.pdf [https://perma.cc/U7KU-89GC] (“The University owns all rights, title and interest in and to Intellectual Property developed as a result of support either directly from or channeled through the University.”); *Patent and Tangible Research Property Policies and Procedures of the University of Pennsylvania*, UNIV. OF PA. 1, <http://pci.upenn.edu/wp-content/uploads/2017/12/Patent-Policy-Most-Recent.pdf> [https://perma.cc/9D9L-BSN5] (all inventions conceived or reduced to practice by inventors in the scope of employment or with substantial use of university resources are the property of the university); *Patent Policy*, PRINCETON UNIV., <https://dof.princeton.edu/policies-procedure/policies/patents> [https://perma.cc/5CZ4-PPG5] (“The University shall own all rights in any discovery or invention resulting from research carried on by any Faculty member, employee, or student”); *Policies and Practices on Intellectual Property: A Summary*, UNIV. OF ILL. 1, https://otm.illinois.edu/sites/all/files/files/ippolicypa_performatted.pdf [https://perma.cc/PQ4K-6LNQ] (“The University is the owner of all software, copyrightable works and inventions.”); *Policy on Intellectual Property*, VA. POLYTECHNIC INST. AND STATE UNIV. 3, <http://www.policies.vt.edu/13000.pdf> [https://perma.cc/DYW8-7954] (“ownership of the IP rests with the University”); *Technology Transfer Policy*, UNIV. OF MICH. 3, <https://techtransfer.umich.edu/for-inventors/policies/technology-transfer-policy/> [https://perma.cc/63EP-A4JE] (Michigan’s policy also contains a trailer clause, claiming that the university owns IP made by a former employee if it was made with

include an irrevocable assignment by the inventor to the university of all right, title, and interest in inventions that he or she may create.²⁹ For example, the Intellectual Property Policy of the University of Texas System states that “the Board of Regents *automatically owns* the intellectual property created by individuals subject to this Rule.”³⁰ Similarly, Rice University’s policy states, “[r]ights to inventions developed by members of the University *shall vest* in the University when there was support of the inventor(s) efforts through use of University funds, facilities, personnel or other resources.”³¹ However, Columbia University’s policy is something of an anomaly. Its introductory comments stress the need for balance between faculty privilege and university rights and needs with respect to inventions and associated technology, and it further states that “faculty members must take the ultimate moral responsibility for the development and commercial exploitation of the fruits of their intellectual activities.”³² Ultimately, however, Columbia lays claim, “as it may fairly and rightly do,” to the commercial rights in inventions resulting from use of its facilities or from activities of faculty members engaged in university service.³³

substantial faculty guidance or university resources, and during activity directly relating to and closely following employment); *University of Maryland Intellectual Property Policy*, *supra* note 25, at 6 (“The University owns all rights, title and interests, including Intellectual Property rights, in Inventions, Software, Research Data and Tangible Research Materials that are created, conceived or reduced to practice by Personnel or Students.”); *University Patent and Invention Policy*, NW. UNIV. 3, https://www.invo.northwestern.edu/invention-disclosure/policies-forms/University_Patent_and_Invention_Policy_090117.pdf [<https://perma.cc/RP2K-B3PW>] (“All Inventions or Discoveries to which this policy applies are owned by Northwestern University.”).

²⁹ See, e.g., *Rule 90101: Intellectual Property*, UNIV. OF TX. SYS. 2, <https://www.utsystem.edu/board-of-regents/rules/90101-intellectual-property> [<https://perma.cc/822H-2DVF>] (emphasis added).

³⁰ *Id.*

³¹ *Rice University Policy No. 333: Patent and Software Policies*, *supra* note 25, at 2 (emphasis added).

³² *Statement of Policy on Proprietary Rights in the Intellectual Products of Faculty Activity*, COLUM. UNIV. 1, <http://www.columbia.edu/cu/vpaa/handbook/appendixd.html> [<https://perma.cc/4UZ9-NTRJ>].

³³ *Id.* Columbia’s policy further recognizes that university-related activities may also give rise to commercially profitable architectural and theatrical designs and technical writings, but it admits that it has not yet determined the proper claims of the university with respect to those properties. *Id.*

Other universities do not make an outright claim of ownership; instead, they require that all patentable inventions must be assigned to the university in the future.³⁴ Stanford University's current IP policy provides that "[t]itle to [potentially patentable] inventions shall be assigned to the University, regardless of the source of funding, if any."³⁵ At the University of Washington, an Executive Order states, "as a condition of employment, and even if a specific patent agreement is not signed, University employees agree to assign all inventions in which the University has an interest to the University."³⁶ Only a few universities have language in their IP policies requiring that, as a condition of employment, faculty and staff members must execute a separate patent agreement assigning all rights in intellectual property to the university.³⁷

Occasionally, sponsorship agreements are given deference to determine ownership of intellectual property created under the agreement.³⁸ Carnegie Mellon's policy provides that "intellectual property created as a result of work conducted under an agreement between an external sponsor and the university that specifies the ownership of such intellectual property shall be owned as specified in said agreement."³⁹ The University of Wisconsin

³⁴ *Inventions, Patents, and Licensing*, STAN. UNIV. § 9.1, <https://doresearch.stanford.edu/policies/research-policy-handbook/intellectual-property/inventions-patents-and-licensing> [<https://perma.cc/AEJ6-S9BY>].

³⁵ *Id.*

³⁶ *Executive Order No. 36: Patent, Invention, and Copyright Policy § 1.C*, UNIV. OF WASH., <http://www.washington.edu/admin/rules/policies/PO/EO36.html> [<https://perma.cc/335R-PBYM>]; see also *Patent Policy*, CAL. INST. OF TECH. 1, <http://www.ogc.caltech.edu/forms/patentpolicy> [<https://perma.cc/WRJ8-J4N7>] ("Inventions made by employees in the line of Institute duty or with the use of Institute facilities may be patented in order to protect and benefit the Institute and the public. Title to such patents is to be assigned to the Institute or, if appropriate, the sponsor."); *Statement of Policy in Regard to Intellectual Property § 1(C)*, *supra* note 16 ("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.").

³⁷ See, e.g., *Intellectual Property Policy*, *supra* note 25; *Ownership and Management of Intellectual Property*, PA. ST. UNIV., <https://policy.psu.edu/policies/ip01> [<https://perma.cc/H2LS-K44J>] ("As a condition of employment, the Intellectual Property Agreement ... is required to be completed and signed."); *Patent Policy*, *supra* note 27 ("An agreement to assign inventions and patents to the University, ... shall be mandatory.").

³⁸ See, e.g., *Intellectual Property Policy*, *supra* note 25.

³⁹ *Id.* at 6 (The policy further provides that it is the responsibility of the Office of Sponsored Research of the university to inform each person whose IP

policy characterizes inventor ownership as a default and states, “[e]xcept as required by funding agreements or other University policies, the University does not claim ownership rights in the intellectual property generated during research by its faculty, staff, or students.”⁴⁰ The policy subsequently states that if there are no specific written agreements to the contrary, the inventor is free to dispose of the rights in the manner of his/her own choosing.⁴¹

Not surprisingly, virtually all of the policies reviewed impose a strict duty of disclosure on members of the university community.⁴² Princeton’s Patent Policy clearly states that “discoveries and inventions must be disclosed to the Office of Technology Licensing as soon as practicable.”⁴³ A few universities explicitly link the disclosure requirement to their obligations under funding agreements.⁴⁴ For example, Texas A&M explains to inventors that “[p]rompt disclosure is especially important for inventions conceived and/or made with federal or state agency funding so that the system ... may meet its legal obligations under such funding agreements.”⁴⁵ Other IP policies are somewhat more permissive and merely encourage inventors to disclose IP in a timely manner.⁴⁶

rights are limited by an externally sponsored agreement of the IP provisions in that agreement in advance of beginning work thereon.). *But see University Patent and Invention Policy, supra* note 28, at 3 (providing that “[w]here the University has entered into an agreement for a project sponsored by a government agency or private firm, the terms of that agreement will govern the disposition of patents and licenses.”).

⁴⁰ *Intellectual Property Policies and Procedures for University Research*, UNIV. OF WIS.-MADISON GRAD. SCH. 4, <https://kb.wisc.edu/images/group156/32996/12.15IntellectualPropertyPoliciesandProceduresforUniversityResearch.pdf> [<https://perma.cc/8RJ6-RBRD>] (observing that this policy “has proven beneficial to the University, the public, and the creators of such property.”).

⁴¹ *Id.* However, in the case of inventions funded by a federal agency or under a sponsored research agreement that require the university to grant rights to the funder, the inventor is required to assign rights to the Wisconsin Alumni Research Foundation, the university’s patent management organization. *Id.*

⁴² *See, e.g., Patent Policy, supra* note 28, at 2.

⁴³ *Id.*

⁴⁴ *See, e.g., Evaluation and Protection of Intellectual Property*, TEX. A&M UNIV. SYS. 1, <http://policies.tamus.edu/17-01-02.pdf> [<https://perma.cc/4BEL-7TEZ>].

⁴⁵ *Id.*

⁴⁶ *See, e.g., Intellectual Property Policy, supra* note 25 (“To assure protection and potential Commercialization, Georgia Tech faculty, staff, and students are encouraged to disclose Intellectual Property to GTRC in a timely manner prior to any disclosure outside of Georgia Institute of Technology.”); *see also Policy on*

Northwestern University attempts to ensure prompt disclosure of inventions to the university by explaining the detrimental effects that public disclosures may have on patent rights:

United States patent law permits the filing of a patent application within one year of publication; however, under foreign patent law, any public disclosure disqualifies the Invention or Discovery from patent protection. Therefore, to protect academic priority as well as commercial priority, any Inventor making any Invention or Discovery subject to this policy is encouraged to report it promptly in writing and in reasonable detail ... preferably within 30 days of making the Invention or Discovery. Public disclosure of the research results may affect patent rights.⁴⁷

These expansive claims of ownership and attendant duties are uniformly imposed on faculty, staff, and other university employees (including students who are also employed by the university in some capacity).⁴⁸ However, in some instances, the language in an IP policy sweeps so broadly that it extends even to undergraduates, graduate and professional students, and non-degree students who are paying tuition and related fees to attend the university.⁴⁹ Harvard University's policy states that it is applicable to all students who use university funds, facilities or other resources.⁵⁰ Columbia University's policy on intellectual property products of faculty activity contains an advisory note indicating that "the Trustees, on the recommendation of the University Senate, made the Policy Statement applicable to all students of the University, regardless of whether they hold appointments as student officers of instruction and research or not."⁵¹

Intellectual Property, *supra* note 28 (explaining that a "timely" disclosure is one made before publication or other enabling nonconfidential disclosure).

⁴⁷ *University Patent and Invention Policy*, *supra* note 28, at 3.

⁴⁸ *Id.*

⁴⁹ *See, e.g., Statement of Policy in Regard to Intellectual Property § 1(C)*, *supra* note 16, at 2.

⁵⁰ *Id.* On its face, the language of Harvard's policy is so broad that it could arguably include students who receive financial aid, although it is unclear whether it is actually administered in that fashion. *See also Patent Policy*, *supra* note 28 ("All Faculty members, employees, and students, in consideration of their membership in the academic community and upon the approval of this policy by the Trustees and the Faculty of Princeton University, agree to handle inventions and patents resulting therefrom as follows.").

⁵¹ *Statement of Policy on Proprietary Rights in the Intellectual Products of Faculty Activity*, *supra* note 32.

Conversely, other universities have created special policies that exempt student coursework and other activities.⁵² For example, the University of Illinois has identified exceptions to its general policy for student entrepreneurship activities⁵³ and student class projects.⁵⁴ The University of Maryland's policy gives extensive ownership rights to students:

Students shall own all rights, title and interests, including Intellectual Property rights, in Inventions, Software, Research Data and Tangible Research Materials they create, conceive or reduce to practice in the performance of their academic and research activities whether or not they use Significant University Resources provided they are not owned by the University under Section V.D.1.⁵⁵

Others simply note that they generally do not claim ownership rights over intellectual property created by students who are not also employees of the university.⁵⁶

⁵² See, e.g., *Student Ownership Policy*, UNIV. OF ILL., <https://otm.illinois.edu/disclose-protect/student-ownership-policy> [<https://perma.cc/BVM5-57VH>].

⁵³ *Id.* at 1–2 (“A variety of campus initiatives support student created start up activities by providing limited amounts of funding, space and other resources. For these student initiated and directed start-ups, the University will allow the students to retain ownership of their intellectual property resulting from these efforts.”).

⁵⁴ *Id.* at 2 (“A similar exception is granted by the Vice President for Research for certain courses (such as industrial arts design or engineering senior design, masters of science in technology management) that allow students to own their inventions made as part of the course.”).

⁵⁵ *University of Maryland Intellectual Property Policy*, *supra* note 25, at 6; see also *Inventions and Related Property Rights*, *supra* note 28 (providing that students may own inventions developed during normal classwork, with routine use of university resources); *Rule 90101: Intellectual Property*, *supra* note 29 (Students, including postdoctoral and predoctoral fellows, generally own the IP they create in courses, during extracurricular activities, and “while using the resources and facilities of U.T. System institutions commonly provided for a student’s use and for which a student has paid tuition and fees.”).

⁵⁶ See *Policy on Intellectual Property*, *supra* note 28; see also *Student Intellectual Property*, PA. STATE UNIV., https://www.research.psu.edu/otm/student_IP [<https://perma.cc/2ZYC-VG6T>] (Penn State likewise has a general rule that student intellectual property that was first conceived or reduced to practice as work product (e.g., homework assignments, laboratory experiments, and independent studies) for a for-credit course will be owned by the student, and the university will not claim ownership of such IP. However, the student policy also includes a number of exceptions for courses and other activities (e.g.,

In a few instances, apparently in recognition of academic freedom and moral considerations, IP policies allow inventors some control over the treatment of their inventions.⁵⁷ Columbia University's policy recognizes that in some circumstances, the commercialization of an invention may adversely affect public health or safety, and it acknowledges that the inventor may have a special interest in preventing such consequences.⁵⁸ As a result, Columbia permits inventors to object, on grounds of conscience, the use of an invention that the inventor believes will adversely affect health or safety, which the university promises to take such objections into consideration.⁵⁹ Purdue University's policy allows Purdue to contribute software to open source projects with permission from funding sponsors, if any, and university administrators.⁶⁰ Stanford University's IP policy contains a broader provision and states that:

inventors, acting collectively where there is more than one, are free to place their inventions in the public domain if they believe that would be in the best interest of technology transfer and if doing so is not in violation of the terms of any agreements that supported or related to the work.⁶¹

II. HOW DID WE GET HERE?

I have observed that many members of the university community, as well as outside commentators, assume that universities have always claimed title to inventions created by their employees and students.⁶² Others believe that university ownership of inventions came about due to the passage of the Bayh-Dole

internships and independent studies) where any resulting IP must be assigned to the university or an outside sponsor.); *Technology Transfer Policy*, *supra* note 28 ("The University will not generally claim ownership of Intellectual Property created by students.").

⁵⁷ See, e.g., *Statement of Policy on Proprietary Rights in the Intellectual Products of Faculty Activity*, *supra* note 32.

⁵⁸ *Id.*

⁵⁹ *Statement of Policy on Proprietary Rights in the Intellectual Products of Faculty Activity* (Paragraph G), COLUM. UNIV., <http://www.columbia.edu/cu/vpaa/handbook/appendix.html> [<https://perma.cc/9R4K-V75Q>].

⁶⁰ *Intellectual Property*, *supra* note 28.

⁶¹ *Research Policy Handbook § 9.1 Inventions, Patents, and Licensing*, STAN. UNIV., <https://doresearch.stanford.edu/policies/30294/print> [<https://perma.cc/FWQ4-YQWU>].

⁶² See *infra* Section II.A.

Act in 1980.⁶³ However, a review of the history of technology transfer reveals that neither assumption is accurate.⁶⁴ University technology transfer practices evolved gradually over the course of the last 100 years, often in response to economic conditions that forced universities to look for alternative sources of funding.⁶⁵ Well before 1980, universities were routinely claiming ownership of faculty and staff inventions and engaged in efforts to commercialize them.⁶⁶ As the following history shows, Bayh-Dole merely provided a final justification for the model and an opportunity to expand it even further.⁶⁷

A. History of University Invention Ownership and Transfer

At the beginning of the twentieth century, no U.S. universities had a written IP policy.⁶⁸ Universities were engaged in basic research, not applied research.⁶⁹ Although very few patentable inventions were generated in the university setting, the general practice was that inventors owned any patents that they decided to pursue arising out of their research activities.⁷⁰

⁶³ See Sean M. O'Connor, *The Real Issue Behind Stanford v. Roche: Faulty Conceptions of University Assignment Policies Stemming From the 1947 Biddle Report*, 19 MICH. TELECOMM. & TECH. L. REV. 379, 412 (2013) (stating that some universities began assuming that Bayh-Dole obligated a contractor's employees to assign inventions by act of law).

⁶⁴ See generally *infra* notes 70–194 and accompanying text.

⁶⁵ See discussion *infra* Part II.A.

⁶⁶ 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, 333 (2009).

⁶⁷ See generally *infra* note 177 and accompanying text.

⁶⁸ See *infra* note 77 and accompanying text. The first formal patent policies were not adopted until 1924.

⁶⁹ ARCHIE M. PALMER, SURVEY OF UNIVERSITY PATENT POLICIES 5 (1948). Further, many university scientists were content to publish the results of their research and dedicate their findings to the public. *Id.* Compare Peter Lee, *Patents and the University*, 63 DUKE L.J. 1, 3–8 (discussing the practical orientation of U.S. academic institutions and the aversion of universities to patenting).

⁷⁰ See discussion of the creation of the WARF, *infra* note 78 and accompanying text. Dr. Harry Steenbock of the University of Wisconsin decided to patent an invention and offered to assign his patent to the university, but the university declined. Instead, Steenbock persuaded several alumni to create the WARF to accept assignment of faculty inventions. See DAVID C. MOWERY ET AL., IVORY TOWER AND INDUSTRIAL INNOVATION: UNIVERSITY-INDUSTRY

In 1912, the Research Corporation was formed by Frederick Cottrell, a professor at the University of California at Berkeley, to commercialize his patents on the electrostatic precipitator, a device that removed dust and fumes from industrial emissions.⁷¹ Cottrell believed that patenting was necessary to give the public the benefit of his inventions since without patent protection, no manufacturer would be willing to invest in commercializing the invention.⁷² Royalties were used to support scientific endeavors and provide grants for researchers.⁷³ Thereafter, the Research Corporation began managing patentable inventions that other academic inventors donated to the organization.⁷⁴ Cottrell observed:

The ever growing number of men in academic positions who evolve useful and patentable inventions from time to time in connection with their regular work and without looking personally for any financial reward would gladly see these further developed for the public good, but are disinclined either to undertake such developments themselves or to place the control in the hands of any private interests.⁷⁵

In the 1920s and 1930s, the Research Corporation received an increased number of requests for patenting and licensing services from faculty inventors, as research collaborations between universities and industry led to a greater volume of potentially valuable discoveries and inventions.⁷⁶

The first formal patent policies were adopted in 1924 by Lehigh University and Columbia.⁷⁷ A year later, the Wisconsin

TECHNOLOGY TRANSFER BEFORE AND AFTER THE BAYH-DOLE ACT 39 (Stanford Univ. Press 2004).

⁷¹ *Id.* at 59. According to Mowery, Cottrell originally considered having the University of California handle licensing of his patents, but he feared this would have adverse effects on the scientific research culture at his university.

⁷² *Id.* (citing Frederick G. Cottrell, *The Research Corporation, an Experiment in Public Administration of Patent Rights*, 4 J. INDUS. & ENGINEERING CHEMISTRY 865 (1912)).

⁷³ *Id.* at 60.

⁷⁴ *Id.*

⁷⁵ *Id.*

⁷⁶ *Id.* at 62.

⁷⁷ PALMER, *supra* note 69, at 18, 19. Despite an initial reluctance, courts became increasingly willing to enforce employee patent assignments, until by the early twentieth century it became the rule that employers owned most employee inventions. See Catherine L. Fisk, *Removing the 'Fuel of Interest' from*

Alumni Research Foundation (WARF) was created to manage patenting and licensing of inventions by University of Wisconsin faculty members.⁷⁸ Harry Steenbock, a professor in Wisconsin's biochemistry department, had discovered that certain milk fats could be fortified with vitamin D when exposed to ultraviolet light.⁷⁹ Steenbock believed that he could have better quality control over the way his method was used, as well as over future developments, if he obtained patent protection.⁸⁰ The Purdue Research Foundation was subsequently formed in 1930.⁸¹

By the 1930s, universities were experiencing the effects of the Great Depression and were becoming increasingly interested in financial returns from exploiting faculty inventions. Despite the financial circumstances, Universities were still often reluctant to become directly involved in patenting and licensing activities.⁸² Further, the small number of patentable inventions generated at most institutions made it impracticable for them to have patent professionals on staff. As a result, faculty inventors were often directed to the Research Corporation.⁸³

MIT became the first university to enter into an institutional Invention Administration Agreement with the Research Corporation.⁸⁴ When Karl Compton became president of MIT in 1930, the school had no formal patent policy, and inventors often kept patent rights in their inventions when agreements with industry sponsors did not require otherwise.⁸⁵ Compton wanted to commercialize patents to earn revenue from university research along with creating a formalized structure to govern relations with industry partners.⁸⁶ Compton therefore commissioned

the 'Fire of Genius': Law and the Employee-Inventor, 1830–1930, 65 U. CHI. L. REV. 1127, 1139 (1998).

⁷⁸ See *History*, WIS. ALUMNI RESEARCH FOUND., <https://www.warf.org/about-us/history/history-of-warf.cmsx> [<https://perma.cc/EH52-XES3>].

⁷⁹ See *id.*

⁸⁰ Jay P. Kesan, *Transferring Innovation*, 77 FORDHAM L. REV. 2169, 2172 (2009).

⁸¹ See *History*, PURDUE RESEARCH FOUND., <https://prf.org/about/history.html> [<https://perma.cc/VTY3-C6S2>].

⁸² MOWERY ET AL., *supra* note 70, at 63.

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ *Id.* at 64.

⁸⁶ HENRY ETZKOWITZ, *MIT AND THE RISE OF ENTREPRENEURIAL SCIENCE* 59–60 (Routledge 2002).

an internal study by MIT's Committee on Patent Policy, which was charged with finding a way to reconcile commercialization of university inventions with MIT's academic mission.⁸⁷ After considerable debate, it was decided that MIT would begin asserting ownership rights over any faculty invention financed by the university. In compensation for ownership, the study recommended that MIT "relieve the Institute of all responsibility in connection with the exploitation of inventions while providing for a reasonable return to the Institute in all cases in which profit shall ensue."⁸⁸ As a result, in 1937, MIT entered into a patent management agreement with the Research Corporation.⁸⁹

Henry Etzkowitz, author of a study on the MIT model, writes that MIT "assumed acceptance of an academic patent right," although the university hoped to engage in patenting in a way that would not be offensive to participants or to the public.⁹⁰ Compton envisioned MIT as an institution of great academic distinction, but his ultimate goal was for the university to play a role in economic development through the creation of new technology companies.⁹¹ MIT struggled to reconcile its interest in commercializing university inventions with its status as a land grant institution, charged with assisting industry. How could it remain a collaborator with industry rather than becoming a competitor?⁹²

During World War II, huge amounts of research dollars began pouring into American universities.⁹³ A group of academics convinced the federal government that universities could develop military technologies, and universities, not industry, were selected to manage major research programs.⁹⁴ Major military research centers were established at MIT, Johns Hopkins, Berkeley, Chicago,

⁸⁷ MOWERY ET AL., *supra* note 70, at 64; ETZKOWITZ, *supra* note 86, at 60. The committee was chaired by Vannevar Bush, then dean of the School of Engineering. MOWERY ET AL., *supra* note 70, at 64.

⁸⁸ MOWERY ET AL., *supra* note 70, at 64 (citing *MIT Patent Committee Statement of Patent Procedure*, MIT Archives, AC64, Box 1).

⁸⁹ ETZKOWITZ, *supra* note 86, at 67. MIT cancelled its agreement with the Research Corporation in 1963 following a dispute over a license to IBM for magnetic core memory technologies. *Id.* at 76.

⁹⁰ *Id.* at 61.

⁹¹ *Id.*

⁹² *Id.* at 62–64.

⁹³ *Id.* at 48.

⁹⁴ *Id.* at 46–47. This marked a major departure from the way that research efforts were handled during World War I.

and Columbia, where faculty members focused on nuclear physics, electronics, and a few other technologies that were key to the military effort.⁹⁵ In the post-war era, the federal government continued to fund university research, and some agencies, such as the National Institutes of Health, expanded their research programs dramatically.⁹⁶ Annalee Saxenian writes, “The Second World War and the ensuing Cold War recast the economic landscape of the United States. The federal government spurred the growth of new industries and regions by channeling resources to university labs to develop war-related technologies.”⁹⁷

Despite the federal investments in university research, formal IP policies were somewhat slow to respond. In a 1948 study of university patent policies, Archie Palmer observed that there was a wide diversity of practice among educational institutions, and even within institutions, regarding the handling of patentable inventions growing out of scientific research.⁹⁸ Palmer reported that only 37 institutions had adopted patent policies at that time: half had been adopted since 1942, and some related only to sponsored research.⁹⁹ Compulsory assignment of patent rights was not mandated at most universities, except when it was required as a result of sponsored research.¹⁰⁰ Instead, “voluntary assignment is preferred.”¹⁰¹ At institutions without formal patent policies, inventors were generally under no obligation to assign rights to the university, although they were sometimes encouraged to work with outside non-profit research foundations which would manage and attempt to commercialize their inventions.¹⁰²

However, in a subsequent study published in 1962,¹⁰³ Palmer reported that the number of universities with formalized IP policies had increased to 147, while another 200 schools observed generally accepted practices in the treatment of intellectual

⁹⁵ *Id.* at 47–48.

⁹⁶ *Id.* at 52.

⁹⁷ ANNALEE SAXENIAN, REGIONAL ADVANTAGE: CULTURE AND COMPETITION IN SILICON VALLEY AND ROUTE 128 11 (Harvard Univ. Press 1996).

⁹⁸ PALMER, *supra* note 69, at 15–17.

⁹⁹ *Id.*

¹⁰⁰ *Id.* at 16.

¹⁰¹ *Id.*

¹⁰² *Id.* at 22.

¹⁰³ ARCHIE M. PALMER, UNIVERSITY PATENTS AND PATENT POLICIES, PRACTICES AND PROCEDURES (National Academy of Sciences, Washington, DC, 1962).

property.¹⁰⁴ Attitudes and practices relating to ownership of inventions were beginning to change.¹⁰⁵ While compulsory assignment of patent rights was not “considered desirable,” except when it was necessary for sponsored research, voluntary assignment was “preferred” in many institutions.¹⁰⁶ Nevertheless, Palmer reported:

Products of academic or institutionally sponsored research conducted by faculty members and other employees as a regular part of their teaching and research responsibilities, especially when patentable, require specific policy determination. When the discovery or invention is directly related to the official duties and responsibilities of the inventor, it is usually the practice to require assignment of title to the institution or its designated agent, with appropriate recognition of the equities of the inventor.¹⁰⁷

Palmer also determined there was little uniformity in the way that sponsored research was handled, with some universities willing to conduct projects only when the university received complete control over publication and intellectual property rights, while others allowed the sponsor to take title to patents and research results.¹⁰⁸ Palmer also observed a disturbing trend: many universities were placing an increasing emphasis on applied as opposed to basic research.¹⁰⁹ Indeed, by 1962 more than 100 universities were receiving patent management services from the Research Corporation or Battelle Development Corporation, another patent management organization.¹¹⁰ Most institutions “recognize[d]

¹⁰⁴ *Id.* at 4–6. Another 596 universities reported that they conducted little or no scientific research and did not have a formal patent policy. *Id.*

¹⁰⁵ *Id.* at 5.

¹⁰⁶ *Id.* at 10.

¹⁰⁷ *Id.* at 28. It is unclear whether Palmer’s reference to inventions that are directly related to the official duties and responsibilities of the inventor refers to employees who were “hired to invent,” or whether he is referring to the general teaching and research responsibilities of an average faculty member.

¹⁰⁸ *Id.* at 9.

¹⁰⁹ *Id.* at 21.

¹¹⁰ *Id.* at 11. Palmer noted that

[m]ost universities and colleges endeavor to avoid becoming involved in the intricate and commercial aspects of patent management, mainly because they do not have the personnel with the requisite specialized knowledge and experience. They recognize that patent management is a complicated undertaking, that it is expensive and that it demands a high degree of legal

the rights and interests of the inventor in his invention” and shared any proceeds from licensing or sale of the patents.¹¹¹

The economic downturn of the 1970s (known to economists as “The Great Inflation”) led to another round of changes in the technology transfer landscape.¹¹² Likely due to its own financial difficulties, the Research Corporation began encouraging universities to assume initial responsibility for evaluating the patentability and commercial potential of faculty inventions.¹¹³ A patent awareness program launched, in 1973, ultimately resulted in the creation of university technology transfer offices that were intended to induce faculty members to disclose inventions which could then be managed by the Research Corporation, but the result was that the universities themselves took on a much larger role in patenting and licensing activities while the Research Corporation continued to decline in importance.¹¹⁴

At the same time that universities were increasing their in-house patenting capabilities, Congress was once again debating whether the government should hold title to inventions made with federal funds or whether patents resulting from federally funded research should be owned by research institutions (i.e., industry or universities).¹¹⁵ In three controversial cases in the

competence, administrative astuteness and promotional zeal—a combination of talent that is not always readily available in an educational institution.

Id. at 38.

¹¹¹ *Id.* at 10.

¹¹² See Brian K. Krumm, *University Technology Transfer—Profit Centers or Black Holes: Moving Toward a More Productive University Innovation Ecosystem Policy*, 14 NW. J. TECH. & INTELL. PROP. 171, 176 (2016) (“Global economic conditions in the 1970s compounded the private sector’s frustrations in attempting to commercialize inventions. America was facing a recession due, in part, to a reduction in the nation’s competitiveness in international markets. ... America faced a slowdown in technological innovation.”).

¹¹³ MOWERY ET AL., *supra* note 70, at 75.

¹¹⁴ *Id.* at 75–76.

¹¹⁵ Rebecca S. Eisenberg, *Public Research and Private Development: Patents and Technology Transfer in Government-Sponsored Research*, 82 VA. L. REV. 1663, 1671 (1996) (“The question of who should own title to these research results has been the subject of heated debate at least since World War II, when unprecedented levels of federal spending on research and development to support the war effort focused the attention of the federal government on the issue.”). However, Mowery observes that while these debates commenced at the end of World War II, universities were largely ignored during the 1940s

1960s, the government claimed ownership of university inventions resulting from federally funded research: Gatorade (invented at the University of Florida), 5-fluorouracil (a chemotherapy drug developed at the University of Wisconsin), and the phenylketonuria test.¹¹⁶ There was an increasing concern that the public was being denied access to beneficial discoveries and inventions because the government owned the rights to those inventions and refused to grant exclusive licenses, thereby preventing them from being developed and commercialized in a meaningful way.¹¹⁷ In response to these criticisms, the Department of Health, Education and Welfare established a system of Institutional Patent Agreements in the late 1960s that allowed universities with approved technology transfer operations to hold title to inventions made with NIH funding and to grant exclusive licenses to industry partners.¹¹⁸ The National Science Foundation and the Department of Defense instituted similar programs, but there was little uniformity in the treatment of patent rights resulting from federally funded research.¹¹⁹

The Bayh-Dole Act of 1980¹²⁰ was the end product of these debates, which ultimately concluded that the most efficient solution was to allow “contractors”¹²¹ (including universities)¹²² to retain

and 1950s because universities accounted for a relatively small percentage of federally funded research and development at that time. MOWERY ET AL., *supra* note 70, at 87.

¹¹⁶ Loise & Stevens, *supra* note 6, at 1.

¹¹⁷ Ashley J. Stevens, *The Enactment of Bayh-Dole*, 29 J. TECH. TRANSFER 93, 94 (2004); see Loise & Stevens, *supra* note 6, at 1 (“Research was literally described in this period as being ‘contaminated’ by federal funding because of the government’s licensing policies.”).

¹¹⁸ Peter Lee, *Patents and the University*, 63 DUKE L.J. 1, 1, 30 (2013). Lee argues that the patent system should sometimes treat academic entities differently than other actors, a concept he calls “academic exceptionalism,” and he documents a recent trend in that direction. *Id.*

¹¹⁹ MOWERY ET AL., *supra* note 70, at 88.

¹²⁰ Bayh-Dole Act of 1980, Pub. L. No. 96-517, 94 Stat. 3015 (codified at 35 U.S.C. §§ 200–11). The Act became effective on July 1, 1981.

¹²¹ The term “contractor” means any person, small business firm, or non-profit organization that is a party to a contract, grant, or cooperative agreement with any federal agency for the performance of experimental, developmental, or research work funded in whole or in part by the federal government. See 35 U.S.C. § 201(b), (c) (Dec. 12, 1980; last amended Nov. 2, 2002).

¹²² The Act clearly provides that the term “nonprofit organization” means universities and other institutions of higher education. See § 201(i).

title to inventions made with federal funding.¹²³ A number of universities, including those that were already actively engaged in patenting and licensing, lobbied for the introduction of the bill and its eventual adoption.¹²⁴ The Act claimed multiple objectives:

It is the policy and objective of the Congress to use the patent system to promote the utilization of inventions arising from federally supported research or development; to encourage maximum participation of small business firms in federally supported research and development efforts; to promote collaboration between commercial concerns and nonprofit organizations, including universities; to ensure that inventions made by nonprofit organizations and small business firms are used in a manner to promote free competition and enterprise without unduly encumbering future research and discovery; to promote the commercialization and public availability of inventions made in the United States by United States industry and labor; to ensure that the Government obtains sufficient rights in federally supported inventions to meet the needs of the Government and protect the public against nonuse or unreasonable use of inventions; and to minimize the costs of administering policies in this area.¹²⁵

The Bayh-Dole Act provides that universities and other contractors may elect to retain title to federally funded inventions by following three simple steps: (1) disclose the invention to the federal agency within a reasonable amount of time after it becomes known to the university's patent administrator; (2) make a written election to retain title within two years after disclosure to the federal agency; and (3) agree to file timely patent applications in the United States and any other countries in which it wishes to retain title.¹²⁶ In return, the federal government receives a

¹²³ § 201(c); *see also* 35 U.S.C. § 202(c)(2) (Dec. 12, 1980; last amended Sept. 16, 2011).

¹²⁴ MOWERY ET AL., *supra* note 70, at 89. Mowery includes references to other studies indicating that universities were unhappy with a review of their patent policies ordered by HEW, prompting university representatives to approach Senators Birch Bayh and Robert Dole about introducing the bill. University licensing officials also actively participated in drafting portions of the proposed legislation. *Id.*

¹²⁵ 35 U.S.C. § 200 (Dec. 12, 1980; amended Nov. 1, 2000).

¹²⁶ *See* 35 U.S.C. § 202(c)(1)–(3) (Dec. 12, 1980; last amended Sept. 16, 2011). If the university fails to promptly disclose an invention or elect to retain title within the stated time, the federal government may receive title to the invention. Similarly, if the university fails to file patent applications in the U.S. or

nonexclusive, nontransferable, irrevocable, paid-up license to practice the invention throughout the world.¹²⁷ The federal government also retains “march-in” rights, allowing it to grant an exclusive or nonexclusive license to a third party, where the university has not taken steps to achieve practical application of the invention within a reasonable time or where such action is necessary to alleviate health or safety needs that are not being satisfied by the university or its licensees.¹²⁸ Universities are required to share any licensing revenues with the inventors, although no specific distribution percentages are set forth in the act.¹²⁹

Following the adoption of Bayh-Dole, university administrators continued to amend their IP policies to expand claims of ownership over inventions created on campus, even claiming rights in the inventions of students, visitors, and other members of the university community.¹³⁰ Some policies justify these broad ownership claims based on the requirements of the Bayh-Dole Act and other federal laws.¹³¹ MIT’s Policy Statements relating to patents provide:

Research contracts sponsored by the Federal Government are subject to statutes and regulations under which MIT acquires title in inventions conceived or first reduced to practice in the performance of the research. MIT’s ownership is subject to a nonexclusive license to the government and the requirement

foreign countries, the federal government may receive title to the invention in any country where patent applications have not been filed. *Id.*

¹²⁷ 35 U.S.C. § 202(c)(4) (Dec. 12, 1980; last amended Sept. 16, 2011).

¹²⁸ 35 U.S.C. § 203(a) (Dec. 12, 1980; last amended Jan. 4, 2011).

¹²⁹ 35 U.S.C. § 202(c)(7) (Dec. 12, 1980; last amended Sept. 16, 2011).

¹³⁰ See *American University Patent Policies: A Brief History*, AM. ASS’N OF UNIV. PROFESSORS, <https://www.aaup.org/sites/default/files/files/ShortHistory.pdf> [<https://perma.cc/JAC3-HPNW>]. According to the AAUP, during the period 1981–2011,

[u]niversities adopt and revise patent policies, replacing invention equity with ownership claims. Universities ... expand ownership claims to include use of resources and participation in extramural research. Some universities also expand definition of “invention” to include “inventions that are not patentable” while others conflate inventions, copyrights, and data under a general heading of “intellectual property” or claim by an arbitrary definition ownership of a broad range of assets, listing variously inventions, works, data, materials, scholarship, and expertise.

Id.

¹³¹ *Id.*

that MIT retain title and take effective steps to develop the practical applications of the invention by licensing and other means.¹³²

Pennsylvania State University's policy declares that its requirement that all members of the university (including administrators, faculty, staff, graduate and undergraduate students, and others) sign an intellectual property agreement arises from the university's "obligations" under the Bayh-Dole Act.¹³³

However, one cannot lose sight of the fact that the Bayh-Dole Act only applies to federally funded research, not to industry-sponsored research or research that is supported by university funds.¹³⁴ Nevertheless, it appears that many universities seized upon Bayh-Dole as a justification to claim ownership of all research conducted on campus, rather than limiting their ownership claims to federally funded research.¹³⁵

At the same time that the Bayh-Dole Act was being deliberated in Congress, the United States Supreme Court issued its opinion in *Diamond v. Chakrabarty*, holding that a genetically engineered bacterium injected with oil degrading plasmids constituted a manufacture or a composition of matter that was entitled to patent protection.¹³⁶ The *Chakrabarty* decision has often been credited with creating the legal foundation for the biotechnology industry that was born in university laboratories in the 1980s when Herbert Boyer (University of California at San Francisco)

¹³² *Guide to the Ownership, Distribution and Commercial Development of MIT Technology*, MASS. INST. OF TECH., https://tlo.mit.edu/sites/default/files/MIT-TLO-ownership-guide_0.pdf [<https://perma.cc/76T3-E98A>]. Similarly, the website of Northwestern University states that its Patent and Invention Policy largely stems from the Bayh-Dole Act. See *University Patent and Invention Policy*, NW. UNIV., <https://www.invo.northwestern.edu/invention-disclosure/policies-forms/patent-invention-policy.html> [<http://perma.cc/3BX9-8HPS>].

¹³³ *Ownership and Management of Intellectual Property*, PA. STATE UNIV., <https://policy.psu.edu/sections/intellectual-property-policies> [<https://perma.cc/N23N-7LUG>].

¹³⁴ 35 U.S.C. § 201(b) (Dec. 12, 1980; last amended Nov. 2, 2002); 35 U.S.C. § 200 (Dec. 12, 1980; amended Nov. 1, 2000).

¹³⁵ See IP policies cited *supra* notes 25–27, where universities claim ownership of all intellectual property created by members of the university community.

¹³⁶ *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980). In support of its decision, the Court famously cited the Committee Reports accompanying the 1952 Patent Act, which stated that Congress intended patent eligible subject matter to include "anything under the sun that is made by man." *Id.*

and Stanley Cohen (Stanford University School of Medicine) invented recombinant DNA technologies.¹³⁷ Peter Lee concludes that “[t]his constellation of legal, economic, and scientific developments created a perfect storm that helped fuel a rapid rise in university patenting after 1980.”¹³⁸

B. Judicial Treatment of IP Policies After the Bayh-Dole Act

When the enforceability of university patent policies and agreements was called into question after Bayh-Dole, courts often ignored established principles of employment law and went to great lengths to avoid holding that the policies and/or agreements were not binding on university personnel.¹³⁹ For example, in *University Patents, Inc. v. Kligman*,¹⁴⁰ the University of Pennsylvania’s patent management corporation brought an action against Kligman, a tenured professor, seeking royalties in connection with an invention he made, and also seeking a declaration of ownership in Kligman’s patent.¹⁴¹ The university alleged that Kligman breached his employment contract with the university and also breached its patent policy,¹⁴² which stated that “any invention or discovery which may result from work carried out on University time or at University expense by special grants or otherwise is the property of the University.”¹⁴³ The Patent Policy was allegedly mailed to faculty members and then published in a 110-page Research Investigator’s Handbook describing various

¹³⁷ SALLY SMITH HUGHES, *GENENTECH: THE BEGINNINGS OF BIOTECH* 150–51 (Univ. of Chicago Press 2011).

¹³⁸ Lee, *supra* note 118, at 35. Lee reports that in 1965, the USPTO granted only 96 patents to 28 U.S. universities. *Id.* However, in 1992, almost 1,500 patents were granted to over 150 universities, and by 2002, U.S. universities were receiving more than 3,000 patents per year. *Id.* According to Lee’s calculations, from 1980 to 2005, the number of patents granted to U.S. research institutions increased by more than 480 percent. *Id.* Note that Lee also credits the creation of the U.S. Court of Appeals for the Federal Circuit as contributing to the rise in university patenting, because he believes it created a climate that was more conducive to filing patent applications. *Id.* at 34.

¹³⁹ See *Univ. Patents, Inc. v. Kligman*, 762 F. Supp. 1212, 1228–29 (E.D. Pa. 1991).

¹⁴⁰ *Id.*

¹⁴¹ *Id.* at 1213.

¹⁴² *Id.* at 1213–14.

¹⁴³ *Id.* at 1215.

university policies and procedures.¹⁴⁴ Although the policy required researchers to sign a Patent Agreement, agreeing to disclose inventions and execute assignment documents and other forms necessary for filing patent applications, there was no evidence that Kligman, a tenured faculty member, ever signed such an agreement; in fact, the court determined that the university generally did not enforce compliance with the requirement to sign a Patent Agreement with any vigor.¹⁴⁵

The district court acknowledged that under Pennsylvania law, an assignment of a patent must be in writing and must show a clear and unmistakable intent to transfer ownership.¹⁴⁶ Further, an agreement *to assign* a patent in the future (i.e., an executory contract) can be in writing or can be implied from the circumstances; however, an employer-employee relationship does not automatically entitle the employer to assignment of inventions made in the course of employment.¹⁴⁷ Instead, an employer will only be entitled to assignment of an employee's inventions if the employee is a party to a contract requiring assignment or where the employee is hired to invent a particular product.¹⁴⁸ Even where an employee uses the time or facilities of the employer to make an invention, the employer is only entitled to a "shop right" (i.e., a nonexclusive, royalty-free license to use the invention).¹⁴⁹

There was clearly no written contract between Kligman and Penn; instead, Penn argued that the university's handbook and policies resulted in an implied contract that required Kligman to assign his invention to the university.¹⁵⁰ The district court noted that, at least in the context of patent rights, courts have been reluctant to imply a contract to assign invention rights,

¹⁴⁴ *Id.* at 1215, 1224.

¹⁴⁵ *Id.* at 1225. Interestingly, a Penn administrator testified in deposition that the Patent Agreement forms were not even included in the 1983 edition of the Faculty Handbook because "[f]ederal laws changed. There was a uniform government patent policy implemented, Public Law 96517; and it was felt under the new law that these kinds of sign-offs weren't required for Federal grants." *Id.* Apparently, Penn believed that the Bayh-Dole Act gave the university title in faculty inventions *ab initio* and that faculty members had no rights to assign. *Id.*

¹⁴⁶ *Id.* at 1219.

¹⁴⁷ *Id.*

¹⁴⁸ *Id.* at 1219–20.

¹⁴⁹ *Id.* (citing *United States v. Dubilier*, 289 U.S. 178, 187–89 (1933)).

¹⁵⁰ *Id.* at 1220–21.

and it recognized that several Pennsylvania courts previously held that an employer's unilateral act of publishing a handbook did not create a contract that bound the employee.¹⁵¹ Rather, the question was what a reasonable employee would believe with regard to the handbook.¹⁵² The court observed that the language of Penn's Patent Agreement and related forms were intended to be enforceable contracts, but the court concluded, "[i]t cannot be said, however, that any reasonable person receiving the handbook, without more, would have understood himself to be bound by the terms of a form agreement he never executed."¹⁵³ Yet, amazingly, the court held that there was some scant evidence that Kligman was aware of the Patent Policy and manifested an intent to be bound by it.¹⁵⁴ Therefore, despite its extensive discussion of the laws which seemed to favor Kligman, the court refused to enter summary judgment in his favor, holding that genuine issues of material fact existed about whether an implied contract to assign the patent existed between Kligman and Penn.¹⁵⁵

Similarly, in *Chou v. University of Chicago*,¹⁵⁶ the Federal Circuit determined that Chou, a graduate student, was obligated to assign her inventions to the university.¹⁵⁷ Even though Chou never signed a written contract, the court found that she accepted her academic appointment subject to the administrative policies of the university, including its patent policy stating that "[e]very patentable invention or discovery that results from research or other activities carried out at the University, or with the aid of its facilities or funds administered by it, shall be the property of the University, and shall be assigned, as determined by the University...."¹⁵⁸ The court made that finding despite the fact that the faculty handbook, in which the patent policy was contained, stated,

¹⁵¹ *Id.* at 1223 (citing *Richardson v. Charles Cole Mem'l Hosp.*, 320 Pa. Super. 106, 108–09 (1983) and *Wells v. Thomas*, 569 F. Supp. 426, 431 (E.D. Pa. 1983) (University of Pennsylvania policies and procedures not legally binding on employee)).

¹⁵² *Id.* (citing *Martin v. Capital Cities Media, Inc.*, 354 Pa. Super. 199, 511 A.2d 830, *alloc. denied*, 514 Pa. 643, 523 A.2d 1132 (1987)).

¹⁵³ *Id.* at 1226.

¹⁵⁴ *Id.* at 1228.

¹⁵⁵ *Id.* at 1229.

¹⁵⁶ *Chou v. Univ. of Chi.*, 254 F.3d 1347 (Fed. Cir. 2001).

¹⁵⁷ *Id.* at 1356.

¹⁵⁸ *Id.* at 1357.

“[t]he contents of this handbook do not create a contract or agreement between an individual and the University.”¹⁵⁹

Another panel of the Federal Circuit held that a graduate student at West Virginia University (WVU) was obligated to assign an antenna patent to WVU, where WVU had a patent policy stating that it owned “worldwide right, title and interest in any invention made at least in part by University personnel,” which included all full- and part-time members of the faculty and staff and all other university employees, including graduate and undergraduate students and fellows.¹⁶⁰ The court had little sympathy for the student’s claims that assignment was merely an option for him to elect or reject, not an obligation, and that he was not given a copy of the patent policy or informed that it applied to him before he made the invention in question.¹⁶¹ Similarly, in *Regents of the University of New Mexico v. Knight*, the court held that a professor and a staff member at the University of New Mexico (UNM) were contractually bound by UNM’s Patent Policy stating that inventions “belong to” UNM, along with a Co-Inventor Agreement stating that UNM was the owner of the inventions.¹⁶² The professor, Scallen, entered into a written contract with UNM each year that incorporated the Patent Policy contained in a faculty handbook.¹⁶³ Knight, the staff member, had no written contract with UNM, but the court still concluded that under New Mexico law, the UNM patent policy created an implied contract between Knight and the university.¹⁶⁴ See also,

¹⁵⁹ *Id.* The Federal Circuit reasoned that the statement had to be read in light of another statement in the handbook, providing that the basic terms and conditions of employment are set out in an employee’s appointment letter. *Id.* Chou’s letter stated that her appointment was subject to the administrative policies of the university. *Id.* However, the court did hold that the university could be liable to Chou under the doctrine of respondeat superior because her advisor allegedly concealed the fact that he had misappropriated her inventions. See *infra* note 201 and accompanying text regarding potential fiduciary duty of a university to its students.

¹⁶⁰ *Univ. of W. Va., Bd. of Trs. v. Vanvoorhies*, 278 F.3d 1288, 1292 (Fed. Cir. 2002).

¹⁶¹ *Id.* at 1298.

¹⁶² *Regents of the Univ. of N.M. v. Knight*, 321 F.3d 1111, 1119 (Fed. Cir. 2003).

¹⁶³ *Id.* at 1118.

¹⁶⁴ *Id.* The court was not persuaded by Scallen and Knight’s argument that UNM’s claim of *initial* ownership of the inventions was contrary to law,

St. John's University, New York v. Bolton,¹⁶⁵ refusing to dismiss St. John's claim that its patent policy required a professor and a graduate student to assign rights in a pharmaceutical invention to the university.¹⁶⁶ The court rejected the policy arguments of the professor and student, who contended that the language in St. John's patent policy was so broad as to constitute an unenforceable "mortgage on a man's brain."¹⁶⁷

In each of these cases, the courts' treatment of university IP policies and faculty handbooks differed substantially from the way they handled the employee handbooks and corporate policies of other types of entities.¹⁶⁸ In a corporate employer-employee setting, courts were generally unwilling to find that handbooks and policies formed binding agreements between the parties (e.g., employee handbooks did not convert at-will employment to a situation where an employee could only be discharged for cause).¹⁶⁹

At least one state even passed legislation declaring that inventions made at a state college or university would be owned by that institution.¹⁷⁰ Under Ohio law:

All rights to and interests in discoveries, inventions, or patents which result from research or investigation conducted in any experiment station, bureau, laboratory, research facility, or other facility of any state college or university, or by employees of any state college or university acting within the scope of their employment or with funding, equipment, or infrastructure provided by or through any state college or university, shall be the sole property of that college or university.¹⁷¹

including the U.S. Constitution, 35 U.S.C. § 261, and case law holding that an invention belongs to its inventor until it is assigned to another. *Id.*

¹⁶⁵ *St. John's Univ., N.Y. v. Bolton*, 757 F. Supp. 2d 144 (E.D.N.Y. 2010).

¹⁶⁶ *Id.* at 152.

¹⁶⁷ *Id.* at 161. The court stated, "[f]ederal courts have consistently upheld the validity of patent-assignment obligations imposed on university students, faculty, and staff as a condition of their research activities at the university." *Id.*

¹⁶⁸ See *Knight*, 321 F.3d at 1118–19; *Univ. of W. Va., Bd. of Trs. v. Vanvoorhies*, 278 F.3d 1288, 1292 (Fed. Cir. 2002); *Chou v. Univ. of Chi.*, 254 F.3d 1347, 1357 (Fed. Cir. 2001); *Bolton*, 757 F. Supp. 2d at 161; *Univ. Patents, Inc. v. Kligman*, 762 F. Supp. 1212, 1219–20, 1223 (E.D. Pa. 1991).

¹⁶⁹ See *Kligman*, 762 F. Supp. at 1219–20, 1223.

¹⁷⁰ *E.I. Du Pont de Nemours & Co. v. Okuley*, 344 F.3d 578, 585 (6th Cir. 2003).

¹⁷¹ OHIO REV. CODE § 3345.14(B), as cited by *E.I. Du Pont de Nemours & Co. v. Okuley*, 344 F.3d 578, 585 (6th Cir. 2003).

The Sixth Circuit raised a question about the constitutionality of that statute under the Takings Clause;¹⁷² however, it remains the law in Ohio today.¹⁷³

C. Stanford v. Roche—A Milestone in Treatment of University Inventions?

Judicial treatment of university patent rights changed abruptly in 2011 when the Supreme Court issued its opinion in *Board of Trustees of the Leland Stanford Junior University v. Roche Molecular Systems, Inc.*, holding that the Bayh-Dole Act does not automatically vest title to federally funded inventions in federal contractors.¹⁷⁴ Mark Holodniy joined Stanford as a research fellow in the Department of Infectious Diseases in 1988 and signed a Copyright and Patent Agreement stating that he “agree[d] to assign” to Stanford his “right, title and interest in” inventions resulting from his research at the university, where he was engaged in developing an improved method for quantifying levels of HIV in patients’ blood samples using PCR (the polymerase chain reaction technique, developed at Cetus).¹⁷⁵ In order to increase his familiarity with PCR, Holodniy’s supervisor arranged for him to conduct research at Cetus.¹⁷⁶ However, Cetus required Holodniy to sign a conflicting agreement stating that he “will assign and do[es] hereby assign” to Cetus his “right, title and interest in each of the ideas, inventions, and improvements” made as a result of his work at Cetus.¹⁷⁷ At Cetus, Holodniy created a PCR-based procedure for calculating the amount of HIV in a patient’s blood.¹⁷⁸ He then returned to Stanford and, along with other employees who assisted him in testing and refining the process, gave a written assignment of rights to Stanford.¹⁷⁹ Stanford obtained three patents on Holodniy’s HIV quantification method.¹⁸⁰

¹⁷² *Okuley*, 344 F.3d at 585.

¹⁷³ § 3345.14(B).

¹⁷⁴ *Bd. of Trs. of the Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc.*, 131 S. Ct. 2188, 2190 (2011).

¹⁷⁵ *Id.* at 2192.

¹⁷⁶ *Id.*

¹⁷⁷ *Id.*

¹⁷⁸ *Id.*

¹⁷⁹ *Id.*

¹⁸⁰ *Id.*

Subsequently, Roche (a medical diagnostics company) acquired Cetus' PCR-related assets (including rights Cetus obtained from Holodniy) and commercialized Holodniy's HIV measurement technique.¹⁸¹

In 2005, Stanford sued Roche for infringing its patents on the PCR technique.¹⁸² Roche defended by arguing that it was a co-owner of the HIV quantification method based on Holodniy's assignment of rights to Cetus, but Stanford countered by claiming that Holodniy had no rights to assign.¹⁸³ Stanford contended that because its HIV research was federally funded by the NIH, it automatically owned all rights in the invention under the Bayh-Dole Act.¹⁸⁴ The district court sided with Stanford and determined that Holodniy had no interest to assign to Cetus, but the Federal Circuit disagreed.¹⁸⁵ The appeals court held that Holodniy's agreement with Stanford constituted a mere "promise to assign rights in the future," whereas his agreement with Cetus actually assigned rights in the invention to Cetus.¹⁸⁶

The Supreme Court granted certiorari and affirmed the Federal Circuit.¹⁸⁷ The Court confirmed that *rights in inventions belong to their inventors*¹⁸⁸ and stated, "[a]lthough much in intellectual property law has changed in the 220 years since the first Patent Act, the basic idea that inventors have the right to patent their inventions has not."¹⁸⁹ While an inventor can assign his rights in an invention to a third party, an employer does not have rights in an employee's invention unless the inventor expressly grants his rights in the invention to the employer.¹⁹⁰ The Court held that the Bayh-Dole Act did not change that basic principle.¹⁹¹ To the contrary, if Congress had intended for Bayh-Dole to vest ownership of federally funded inventions in the university, it would

¹⁸¹ *Id.*

¹⁸² *Id.* at 2193.

¹⁸³ *Id.*

¹⁸⁴ *Id.*

¹⁸⁵ *Id.* at 2194.

¹⁸⁶ *Id.*

¹⁸⁷ *Id.*

¹⁸⁸ *Id.* at 2195 (emphasis added).

¹⁸⁹ *Id.*

¹⁹⁰ *Id.*

¹⁹¹ *Id.* at 2195–96.

have clearly provided that title to such inventions was owned by the contractor (i.e., the university).¹⁹² Instead, when the Bayh-Dole Act provides that a contractor may elect to retain title, “it simply assures contractors that they may keep title to whatever it is they already have.”¹⁹³ That is, “[t]he Bayh-Dole Act does not confer title to federally funded inventions on contractors or authorize contractors to unilaterally take title to those inventions.”¹⁹⁴

One might have expected that, following *Stanford v. Roche*, universities would have rushed to amend their IP policies and agreements and bring them into line with the Court’s holding.¹⁹⁵ Surprisingly, few changes have occurred.¹⁹⁶ The American Association of University Professors complains:

Universities generally ignore *Stanford v. Roche* decision in their policies and guidance documents. Some universities, notably

¹⁹² *Id.* at 2195. The Court observed that on those few occasions in the past when Congress has divested inventors of their rights in inventions, it has “provided unambiguously” that those inventions become the property of the United States (e.g., inventions belonging to the Atomic Energy Commission, NASA, or the Department of Energy). *Id.*

¹⁹³ *Id.* at 2197.

¹⁹⁴ *Id.* The Court noted that agencies that provide funding to contractors expect those contractors to obtain invention assignments from their employees. *Id.* For instance, NIH guidance documents clearly provide that “[b]y law, an inventor has initial ownership of an invention,” and contractors should utilize assignment agreements to obtain ownership of inventions. *Id.* at 2199.

¹⁹⁵ See Robert M. Yeh, *The Public Paid for the Invention: Who Owns It?*, 27 BERKELEY TECH. L.J. 453, 500 (2012) (arguing that the Supreme Court reached the correct decision in the *Stanford* case for economic and policy reasons).

¹⁹⁶ *Stanford’s* policy on Inventions, Patents and Licensing states:

All potentially patentable inventions conceived or first reduced to practice in whole or in part by members of the faculty or staff (including student employees) of the University in the course of their University responsibilities or with more than incidental use of University resources, shall be disclosed on a timely basis to the University. Title to such inventions *shall be assigned* to the University, regardless of the source of funding, if any.

Research Policy Handbook § 9.1 Inventions, Patents, and Licensing, *supra* note 61. The policy also states that all faculty, staff, student employees, graduate students, and postdoctoral fellow must sign the Stanford University Patent and Copyright Agreement, and each department is responsible for ensuring that the agreement has been signed. *Research Policy Handbook § 9.2(2)(C)*, STAN. UNIV., <https://doresearch.stanford.edu/policies/research-policy-handbook/intellectual-property/copyright-policy> [<https://perma.cc/Z9Zn-2RNY>]. The agreement does not appear to be available for public viewing.

Stanford, University of California, and University of Washington insert “present assignment” language into policy and employment documents, purporting to enact “automatic” assignment of any future inventions made by faculty. Advocates argue that such draconic ownership policies are necessary to preserve the institutional technology licensing industry that has been created around faculty inventions, and without this industry in place inventions will “sit on the shelf” and America will become a global technology backwater.¹⁹⁷

Thus, despite the *Stanford* case, and as the survey of IP policies in Part I confirms, most universities continue to make blanket claims of ownership in university inventions, sometimes even claiming that ownership automatically vests in the university.¹⁹⁸

It seems apparent that changes need to be made in the way that most universities handle their technology transfer functions, particularly with respect to the assertions of invention ownership contained in their IP policies.¹⁹⁹ I offer two proposals for addressing the situation. One is a more conservative set of revisions that could be implemented immediately by universities, but which would make meaningful alterations to most universities’ policies and procedures. The other is a more long-ranging proposal that considers opportunities to reshape the current landscape and place the university in a role where it supports the activities of university inventors and entrepreneurs.

III. A MODEST PROPOSAL FOR SHORT-TERM CHANGE

If universities are going to claim ownership rights over inventions made by members of the university community, several changes must be implemented immediately.

First, tuition-paying students should not be required to assign their inventions to the university. Undergraduates, graduate students who are not supported by the university (for example, many students in the arts and humanities), and professional

¹⁹⁷ *American University Patent Policies: A Brief History*, AM. ASS’N OF UNIV. PROFESSORS 2, <https://www.aaup.org/sites/default/files/files/ShortHistory.pdf> [<https://perma.cc/5HP7-9Z8P>].

¹⁹⁸ See *Inventions and Related Property Rights*, *supra* note 28.

¹⁹⁹ See Brian Cummings, *The Changing Landscape of Intellectual Property Management as a Revenue-Generating Asset for U.S. Research Universities*, 21 GEO. MASON L. REV. 1027, 1046 (2014).

school students (e.g., law students and business students) should own their inventions, absent some extraordinary circumstances.²⁰⁰ Unless a student is also an employee of the university, such as a research assistant or a technician in a professor's laboratory who might be in a position to contribute to an invention or other technology, then treating a student like a university employee simply does not make any sense. Merely receiving federal or state financial aid or a university scholarship should not convert a student into a pseudo-employee. Indeed, it could even be argued that claiming ownership of student inventions is a breach of the university's fiduciary duties to its students.²⁰¹

In some limited instances, a student may enroll in a credit-bearing course such as a capstone or an externship that is supported by an outside sponsor.²⁰² At some universities, industry sponsors provide financial support for engineering capstone courses, designate company employees to act as mentors to capstone teams, and may even provide research data or other proprietary information to form the basis of a team project; in return, the sponsor may require that any intellectual property created in the capstone be assigned to the sponsor.²⁰³ Likewise, students participating in

²⁰⁰ For an interesting discussion about student inventors, see Samantha Stainburn, *Who Owns Your Great Idea?*, N.Y. TIMES, <https://www.nytimes.com/2009/01/04/education/edlife/whoseidea-t.html> [<https://perma.cc/69D7-PHUJ>]. See also Bryce C. Pilz, *Student Intellectual Property Issues on the Entrepreneurial Campus*, 2 MICH. J. PRIV. EQUITY & VENTURE CAP. L. 1, 27 (2012).

²⁰¹ Several commentators have argued that the university-student relationship is a fiduciary relationship. See, e.g., Brett G. Scharffs & John W. Welch, *An Analytical Framework for Understanding and Evaluating the Fiduciary Duties of Educators*, 2005 B.Y.U. EDUC. & L.J. 159, 160 (2005); see also J. DOUGLAS TOMA, *MANAGING THE ENTREPRENEURIAL UNIVERSITY: LEGAL ISSUES AND COMMERCIAL REALITIES* (Routledge 2011) ("The historical parental relationship with the institution has evolved into a contractual one, with higher education no longer regarded as a privilege, but instead deemed a purchased good."); Kent Weeks & Rich Haglund, *Fiduciary Duties of College and University Faculty and Administrators*, 29 J.C. & U.L. 153, 162–70 (2002) (discussing research opportunities and ownership of patents).

²⁰² See, e.g., *Computing, and Cyber Systems Capstone*, N. ARIZ. UNIV. SCH. OF INFORMATICS, <https://nau.edu/school-of-informatics-computing-and-cyber-systems/capstone/> [<https://perma.cc/2FTB-N99Q>]; Georgia Tech Capstone Design, <https://capstone.gatech.edu/sponsors/> [<https://perma.cc/Y7GX-QUDY>].

²⁰³ See, e.g., Pennsylvania State University Department of Agricultural and Biological Engineering, <https://abe.psu.edu/industry/capstone-design> [<https://>

externships may be placed in a position where they could create an invention or other technology that will be claimed by the host.²⁰⁴ In these settings, students should be informed in advance that the sponsor or host will own any IP created during the capstone, externship, or similar activity, and that the students will be required to assign their innovations to the sponsor. For required courses like engineering capstones, the students must also be provided an alternative to participating in the sponsored activity, so that they will have an opportunity to own their inventions and creations, and they should not be penalized if they do not elect to participate in the sponsored research.

Next, if universities are going to require faculty, staff and other employees to assign inventions to the university, then they must revise their IP policies to more accurately reflect the state of the law.²⁰⁵ Universities should eliminate language that incorrectly suggests that ownership of inventions created by faculty and other employees will automatically vest in the university.²⁰⁶ Instead, they should replace such language with a provision that clearly states that the employee is required to assign intellectual property to the university as a condition of employment. Educational institutions might consider adopting a provision along the following lines:

perma.cc/S99T-EHKG] (“The university Intellectual Property Agreement will provide the sponsor with ownership of all intellectual property that is developed during the course of the project.”).

²⁰⁴ See, e.g., Guidelines for Sponsors of Capstone Senior Design Projects at VCU College of Engineering (CoEgr) 2, <https://egr.vcu.edu/media/school-of-engineering/capstone-files/documents/CapstoneSponsorGuidelines.pdf> [<https://perma.cc/Y9ZG-XRVW>] (“To provide IP protection to the sponsor’s project, the VCU College of Engineering has a straight-forward, client-friendly approach for undergraduate students to assign these rights to the sponsor. Sponsors have until September 30th to request students assign any IP generated on their project to the sponsoring company.”).

²⁰⁵ It could be argued that if universities are going to follow the model of high technology companies and claim ownership rights in the work of their faculty and staff employees, then universities should start acting more like corporations and be held to the same standards. *But see Changing University IP Policy to Support Academic Freedom and Innovation*, AM. ASS’N OF UNIV. PROFESSORS 3, <https://www.aaup.org/sites/default/files/files/ApproachIPpolicy.pdf> [<https://perma.cc/4TBP-P334>] (arguing that corporate IP practices do not work in universities).

²⁰⁶ See *supra* notes 174–99 and accompanying text for a discussion of *Stanford v. Roche*.

As a condition of my employment with the University, I hereby assign and agree to assign in the future to the University all rights, title, and interest in and to any and all Inventions conceived or reduced to practice by me, either alone or jointly with others, that are made with the use of University facilities, resources, or funding, including sponsored research activities administered by the University, or within the scope of my employment with the University.

Such a provision accomplishes three important goals: (1) it demonstrates that there is consideration for the agreement; (2) it contains a present assignment and a promise to assign in the future; and (3) it limits the scope of any such assignment to inventions made with university resources or funding, or falling within the scope of employment.²⁰⁷

Finally, all members of the university community subject to the IP policy and claims of university ownership should be made aware of the policy and its implications on their work. Universities should stop burying their IP policies on their websites, deeply embedded under obscure titles, or in the appendices of lengthy faculty handbooks; they need to be brought to the forefront where they can be easily accessed by stakeholders and other interested parties. For new employees, IP policies should be discussed and explained in “onboarding” or orientation programs. Further, the policies should be written in language that makes sense to non-lawyers, and they should be organized in a comprehensible manner. A policy that has such a profound impact on the rights of faculty and staff should be accessible, and it should be understandable.

Implementing these modest proposals will result in a more equitable and transparent environment on campus, where faculty, staff, and other employees have a clearer understanding of the terms of their employment or appointment and the rights they are required to forfeit to the university.

IV. A LONG-TERM PROPOSAL FOR INSTITUTIONAL CHANGE

The very basic proposals set out in Part III beg the question of whether university ownership and control over inventions

²⁰⁷ See also Parker Tresemer, *Best Practices for Drafting University Technology Assignment Agreements After Filmtec, Stanford v. Roche, and Patent Reform*, 2012 U. ILL. J.L. TECH. & POL'Y 347, 374–76 (2012) (proposing similar language).

is a good thing, and whether it should be continued. While proponents of the model argue that university technology transfer plays an important role in moving research from the laboratory to the public,²⁰⁸ critics have identified numerous problems with university ownership of inventions.²⁰⁹ In the first place, it appears that many universities are not particularly adept at carrying out the technology transfer function.²¹⁰ A number of studies have shown that most universities lose money on technology transfer—the few exceptions are those universities that make “big hits”²¹¹ like Gatorade or Neupogen.²¹² Technology transfer

²⁰⁸ Compare Randi B. Isaacs, *Inside a University's Technology Transfer Office: Purposes and Goals for Protecting a University's Intellectual Property*, 8 No. 3 LANDSLIDE 30, 30 (2016), with Kristen Osenga, *Rembrandts in the Research Lab: Why Universities Should Take a Lesson from Big Business to Increase Innovation*, 59 ME. L. REV. 407, 418 (2007) (arguing that patent ownership could advance research, if universities adopt effective patent management programs; Osenga states, “there is some reason to believe that the parade of horrors attributed to university patenting is unwarranted.”).

²⁰⁹ See, e.g., Martin Kenney & Donald Patton, *Reconsidering the Bayh-Dole Act and the Current University Invention Ownership Model*, 38 RES. POL'Y 1407, 1408 (“[T]he current university invention ownership model is plagued by ineffective incentives, information asymmetries, and contradictory goals for inventors, potential licensees, the university, and university technology licensing offices.”).

²¹⁰ See Joseph Allen, *Does University Patent Licensing Pay Off?*, IP WATCHDOG (Jan. 27, 2014), <https://www.ipwatchdog.com/2014/01/27/does-university-patent-licensing-pay-off/id=47655/> [<https://perma.cc/X2G8-RU99>] (“most university technology transfer offices (TTO’s) are not worth their cost because they are not self-supporting through patent licensing income”) (citing *University Start-Ups: Critical for Improving Technology Transfer*, BROOKINGS INSTITUTION (2013) (finding that universities spend the vast majority of their revenues rewarding inventors or funding new research, not supporting technology transfer operations)); Cummings, *supra* note 199, at 1034 (university technology transfer is a value-losing proposition in most cases; legal costs are extremely high and consume as much as 60 percent of a tech transfer office’s budget, meaning that few tech transfer offices can make money or even cover their costs).

²¹¹ Irene Abrams et al., *How are U.S. Technology Transfer Offices Tasked and Motivated—Is It All About the Money?*, 17 RES. MGMT REV. 18, 19–20 (2009) (documenting several “big hits” from 1990 through 2008; the authors conclude that financial return is not the major motivator in technology transfer, but that universities need to invest in their TTOs in order to provide the public with the benefits of academic research).

²¹² See Love, *supra* note 14, at 308 (concluding that universities spend more obtaining and maintaining high-tech patents than they earn back in overall royalties—based on the data he examined, Love determined that even based on a set of very favorable assumptions, the patent activity reported by

offices (TTOs) are notoriously understaffed and overworked, and the TTO staff may not be composed of an appropriate combination of attorneys, engineers and scientists, and marketing professionals.²¹³

Faculty members are required to disclose their inventions and then delegate all authority to the TTO to negotiate licenses.²¹⁴ However, TTOs are typically rewarded by the university based on the amount of revenue generated rather than the number of inventions commercialized.²¹⁵ As a result, TTOs have become “gatekeepers rather than facilitators of commercialization.”²¹⁶ Further, the “home run” mentality leads TTOs to focus their efforts on technologies that seem to offer the largest and most immediate returns, meaning that inventions with longer term potential may be ignored.²¹⁷

Faculty members and graduate students, on the other hand, frequently resent the push to keep their inventions secret.²¹⁸ They are told that they should not publish their research results or share them at conferences, the types of activities that provide professional recognition and may lead to tenure, but instead they should work with their technology transfer office to file a patent application.²¹⁹ One commentator suggested that

participants in his survey would result in a negative rate of return of over three percent); Jerry G. Thursby & Marie C. Thursby, *University Licensing*, 23 OXFORD REV. OF ECON. POL'Y 620, 629 (2007) (in 2004, 40 percent of TTOs participating in the AUTM survey earned less than \$600,000 after legal and related fees, but before they paid the salaries of their employees); cf. David B. Audretsch, *Scientific Entrepreneurship: The Stealth Conduit of University Knowledge Spillovers*, 21 GEO. MASON L. REV. 1015, 1025 (2014) (university scientists are more prolific in their entrepreneurial activities that had been reflected by previous studies based on AUTM data; over one in ten scientists have started a business based on their scientific research).

²¹³ Paul M. Swamidass & Venubabu Vulasa, *Why University Inventions Rarely Produce Income? Bottlenecks in University Technology Transfer*, 34 J. TECH. TRANSFER 343, 350 (2008) (observing that university technology transfer offices often have inadequate capacity to market university inventions).

²¹⁴ Robert E. Litan, Lesa Mitchell & E.J. Reedy, *Commercializing University Innovations: Alternative Approaches*, 8 INNOVATION POL'Y & THE ECON. 31, 41 (2007).

²¹⁵ *Id.* (referring to this as the “revenue maximization model” of technology).

²¹⁶ *Id.* at 43.

²¹⁷ *Id.*

²¹⁸ See Swamidass & Vulasa, *supra* note 213, at 345, 358.

²¹⁹ Jennifer Carter-Johnson, *Intellectual Property Revenue Sharing as a Problem for University Technology Transfer*, 49 AKRON L. REV. 647, 655–58

university patent policies have given rise to the “patent police”, who roam the halls of academia searching for inventions and urging faculty members to keep their work secret.²²⁰ In any case, faculty members may experience months of delays in publication and dissemination of their research findings while they wait for the TTO to file patent applications.²²¹ In the meantime, a faculty member at a different institution might make and publicize a competing discovery, stealing the limelight from the first researcher.²²²

Moreover, in many instances it seems that the TTOs simply do not do a very good job of handling inventions.²²³ Consider the following hypothetical: Professor Sally, a faculty member at a university, invents something under a sponsored research agreement with federal funding or industry support. Under her university’s IP policy, the university claims ownership of all rights in her invention, and Sally is required to promptly disclose the invention to the technology transfer office. The TTO may choose to file a provisional patent application, which will likely be based largely on the disclosure document prepared by Sally, not an application drafted by a patent attorney. In an effort to find a licensee for Sally’s invention, the TTO then posts a description of the invention on the website, thus making what is arguably a public disclosure for patent law purposes. If no licensee is located, the university may decide to return the invention to Sally, but often that decision is not made until near the end of the twelve-month deadline for filing a full utility application. As a result, Sally (who does not understand the patent laws and the timing implications) does not have time to locate a patent attorney and file a nonprovisional application. Her provisional application goes abandoned, she loses her priority date, and her invention may go into the public domain due to the website posting and any other

(2016) (the academic research environment creates disincentives to disclosure of inventions, including a sense of community based on free sharing of ideas, fear that disclosure will lead to delay in publication or conference presentations, and a lack of education about patent law generally).

²²⁰ Love, *supra* note 14, at 323, 330.

²²¹ Carter-Johnson, *supra* note 219, at 657.

²²² *See id.* at 656 (illustrating that academic researchers are motivated primarily by non-monetary goals like intellectual freedom and recognition for their work).

²²³ *See id.* at 656–57 (discussing how academic researchers fear the publication and patent filing delays that come with disclosing their innovations to TTOs).

disclosures that were made in the interim. Unfortunately, that is the situation that plays out all too often in universities today.²²⁴

As an alternative to seeking outside licensees, universities are increasingly pushing faculty members (whose expertise is in science or engineering, not business management) to license their inventions back from the university themselves and use those inventions as the basis for starting a company.²²⁵ The startup may pay an upfront, fixed licensing fee and/or may promise to pay royalties to the university in the future, assuming that the invention is successfully commercialized.²²⁶ After repaying itself for costs associated with patent prosecution, the university will then distribute any remaining royalties.²²⁷ A portion will be paid to the inventor, the inventor's department or college may receive a share, and the remainder is to be reinvested in research and development at the university.²²⁸

A recent IP Watchdog article explained the drive to create university startups:

Now, startups are the lifeblood of technology transfer. Classical licensing to large companies for very successful payoffs are far and few between. The key reason for this is the fact that most university technologies are very early stage and hence licensed at a huge discount. Startups on the other hand are de-risked through the maturation of the technologies and become very attractive acquisitions. Recent studies have shown that technologies acquired from universities are orders of magnitude lower in value than acquisition of startups. Startups will be the crown jewels of technology transfer in the future.²²⁹

In an effort to help ensure the success of the startup, the university-licensor may encourage the new company to locate in a university incubator, and university officials may even take an active role in the day-to-day management of the company or may

²²⁴ *See id.*

²²⁵ *See* Dipanjan Nag, *The Changing Face of University Technology Transfer*, IP WATCHDOG (Oct. 9, 2017), <https://www.ipwatchdog.com/2017/10/09/the-changing-face-of-university-technology-transfer/id=88853/> [<https://perma.cc/VX6E-XRJG>].

²²⁶ *Id.*

²²⁷ *See* Love, *supra* note 14, at 311.

²²⁸ *See id.*

²²⁹ Nag, *supra* note 225.

assist with locating outside investments.²³⁰ However, the start-up will likely be required to pay fees to the university for these services, or the university may take an equity stake in the start-up company.²³¹

The university technology transfer-entrepreneurship shell game is therefore deeply troubling and can lead to significant potential conflicts of interest between the university and its faculty members. Some universities are apparently attempting to turn their teaching and research faculty into income generators for the school, and those faculty members may be diverted from their traditional roles as educators and researchers.²³² These concerns have led critics to question whether there is any appropriate role for the university or its technology transfer office to play where the faculty inventor is interested in creating a startup company to develop and commercialize his or her inventions.²³³ They argue that TTOs are only interested in enhancing licensing revenues, not actually transferring technology to a company that can bring it to practical realization for the benefit of the public.²³⁴ They also point out that faculty members understand their inventions better than TTO staff members and have closer connections to industry members and potential licensees, and therefore faculty inventors may be in a better position to ensure that the invention is brought to practical application.²³⁵

²³⁰ *Id.*

²³¹ Kenney & Patton, *supra* note 209, at 1411.

²³² *See id.* at 1413 (illustrating the difference in the structure of work between university professors and corporate researchers).

²³³ *See id.* at 1411 (“If the inventor is intent upon establishing a firm, there is no economic reason for university TLO involvement.”); *cf.* Liza Vertinsky, *Universities as Guardians of Their Inventions*, 2012 UTAH L. REV. 1949, 2011–14 (2012) (discussing several more effective examples of technology transfer to university startups, including the Universities of Wisconsin, Utah, Michigan and Maryland).

²³⁴ Kenney & Patton, *supra* note 209, at 1410, 1419.

²³⁵ *Id.* at 1411. *Cf.* Samuel Estreicher & Kristina A. Yost, *University IP: The University as Coordinator of the Team Production Process*, 91 IND. L.J. 1081, 1103–04 (2016) (arguments in favor of faculty ownership of inventions are not well developed; while there may be room for improvement in the technology transfer process, such as adoption of best practices, there is insufficient evidence to support a change in the current model of university ownership of faculty inventions.).

The effect of the technology transfer function on education can also be questioned. If technology transfer ultimately takes industry relationships out of the hands of faculty members and places them in the hands of the university and TTO, this may result in a disservice to students.²³⁶ Interference with faculty-industry relationships may jeopardize industry involvement with capstone projects and result in less support for other student research projects.²³⁷ It may also lead to reduced opportunities for student employment after graduation.²³⁸ Further, if TTOs almost always lose money, one could question whether that eventually translates into increased tuition costs for students.²³⁹

A. Is There a Better Model that Could Be Implemented?

All of these concerns about the efficacy and propriety of university technology transfer operations have caused academics and other commentators to ask whether there is a better model that could be implemented in order to move more inventions out of the university.²⁴⁰ One group believes that the Bayh-Dole Act must be amended in order to ensure that university inventions reach the public, although their proposed amendments take various forms.²⁴¹ One proposal suggests that Bayh-Dole should be amended to remove the requirement that the university file patent applications, since not all inventions need to be patented in order to be commercialized.²⁴² Conversely, the Act might be changed to explicitly recognize that in the university setting, faculty members are the “contractors,” not the universities, thereby placing ownership of inventions in the hands of the inventors rather than the institution. Another argues that the Act should be altered to include a mechanism that automatically transfers ownership of

²³⁶ See Kenney & Patton, *supra* note 209, at 1410, 1414 (illustrating TTOs’ control over faculty members, limiting faculty interaction with industry).

²³⁷ See generally *id.*

²³⁸ See generally *id.*

²³⁹ See generally *id.*

²⁴⁰ See Margo A. Bagley, *Academic Discourse and Proprietary Rights: Putting Patents in Their Proper Place*, 47 B.C. L. REV. 217, 246–47 (2006); Kenney & Patton, *supra* note 209, at 1410, 1419.

²⁴¹ Kenney & Patton, *supra* note 209, at 1411.

²⁴² Bagley, *supra* note 240, at 246–47. Bagley also proposes an opt-in extended grace period for academic researchers.

university inventions to the contractor-university, bypassing the employee-inventor.²⁴³ Others firmly contend that the Act is not broken and does not need to be fixed.²⁴⁴

A second group vigorously argues for a return to the “professor’s privilege,” where university inventions are always owned by their inventors, not by the university.²⁴⁵ The American Association of University Professors steadfastly maintains that faculty members should control their own research, including their inventions, and should either own those inventions or be closely involved in decisions about their management, licensing and commercialization.²⁴⁶ The idea of faculty ownership of inventions does have a certain intuitive appeal. It appears to be consistent with norms of academic freedom and independence. Further, university professors are not typical employees like their counterparts in industry.²⁴⁷ Professors drive their own research agendas and, other

²⁴³ Toshiko Takenaka, *Serious Flaw of Employee Invention Ownership Under the Bayh-Dole Act in Stanford v. Roche: Finding the Missing Piece of the Puzzle in the German Employee Invention Act*, 20 TEX. INTELL. PROP. L.J. 281, 321–22 (2012).

²⁴⁴ Association of University Technology Managers, *The Bayh-Dole Act: It’s Working*, <https://www.autm.net/AUTMMain/media/Advocacy/Documents/BayhDoleTalkingPointsFINAL.pdf> [<https://perma.cc/N5VN-HHEY>] (The Bayh-Dole Act is as viable today as when it was passed, is good for the economy, and spurs job creation); see also Ian Ayres & Lisa Larrimore Ouellette, *A Market Test for Bayh-Dole Patents*, 102 CORNELL L. REV. 271, 301 (2017) (proposing that Bayh-Dole should be mended, not ended, by creating a market test that asks whether firms would be willing to commercialize an invention in exchange for a non-exclusive license for a nominal fee, prior to seeking an exclusive licensee).

²⁴⁵ See, e.g., Seminar Paper, Hans K. Hvide & Benjamin F. Jones, *University Innovation and the Professor’s Privilege* 1, 3 (June 2017), <https://www.kellogg.northwestern.edu/faculty/jones-ben/htm/University%20Innovation%20and%20the%20Professors%20Privilege.pdf> [<https://perma.cc/87PF-N2SE>] (demonstrating that when Norway abolished the professor’s privilege and moved to the U.S. model, where the university owns faculty inventions, a 50 percent decline in both patenting rates and entrepreneurship was experienced).

²⁴⁶ Report, Gary R. Nelson et al., *Defending the Freedom to Innovate: Faculty Intellectual Property Rights After Stanford v. Roche*, AM. ASS’N. OF UNIV. PROFESSORS 10, 17 (June 2014), https://www.aaup.org/sites/default/files/files/aaupBulletin_IntellectualPropJune5.pdf [<https://perma.cc/T2WS-CEL8>].

²⁴⁷ Chew, *supra* note 19, at 266 (“Dubilier makes clear that typical university faculty members would not be considered employees that are ‘hired to invent’ merely because research is part or all of their job responsibilities.”); see also Sunil R. Kulkarni, *All Professors Create Equally: Why Faculty Should Have Complete Control Over the Intellectual Property Rights in Their Creations*, 47 HASTINGS L.J. 221, 232 (1995).

than being hired to teach specific classes, the direction of their research is generally not dictated by the university.²⁴⁸ Such considerations argue in favor of allowing faculty members and other university employees to retain ownership and control over their inventions, which they undoubtedly know and understand better than the university.²⁴⁹

However, dismantling the entire technology transfer system and leaving university inventors on their own would be hugely problematic in its own right and would be extremely disruptive. Also, many faculty members, graduate students, and other employees may not want to be responsible for patenting and commercializing or licensing their inventions, or they may not be able to afford to do so.

B. An Alternative Proposal

Instead, I propose a hybrid system where university inventors have the *option* to retain ownership of their inventions, if they are interested in commercializing those inventions through a startup company in which they have an ownership interest or by licensing directly to a third party. The option to retain ownership and control over their inventions would allow university personnel to leverage and enhance their relationships with industry.²⁵⁰ Faculty members would be directly involved in

²⁴⁸ Carter-Johnson, *supra* note 219, at 478–79, 481 (academic researchers and faculty members are not acting as agents of the university; academic laboratories operate as autonomous units within the university, and faculty members have the right to decide how to shape their research); Kenney & Patton, *supra* note 209, at 1413 (many economists and policy makers state falsely that university inventors are employees in the same way that corporate researchers are employees).

²⁴⁹ James D. Clements, *Improving Bayh-Dole: A Case for Inventor Ownership of Federally Sponsored Research Patents*, 49 IDEA 469, 498–500 (2009) (assigning ownership of patents to university inventors makes sense, since they are likely to be able to put those patents to their best use); *cf.* Peter van Dongen et al., *The Relationships Between University IP Regimes, Scientists' Motivations and Their Engagement with Research Commercialization in Europe*, 8 EUR. J.L. & TECH. 1, 13 (2017) (concluding that a greater percentage of faculty members are involved in entrepreneurship and commercialization of research at universities that do take ownership of IP and have obligatory technology transfer services).

²⁵⁰ See Dirk Czarnitski et al., *Individual versus Institutional Ownership of University-Discovered Inventions* (USPTO Economic Working Paper No. 2017-07,

negotiating agreements for industrially sponsored research, which would likely result in increased collaboration with industry partners and enhanced opportunities for student mentorships, internships, and employment after graduation.²⁵¹ University inventors who want to create a startup would be able to assign inventions directly to that company without the university acting as an intermediary that imposes a tax (in the nature of licensing fees) on that transaction.²⁵²

Those inventors who do not wish to own and manage their inventions and other IP could assign their rights to a university patent foundation that bears responsibility for managing the technology. The patent foundation would be a non-profit organization that is legally separate from the university, not a technology transfer office that operates as an administrative division of the university itself.²⁵³ The patent foundation would accept assignment of inventions from faculty and other members of the university community, seek patent protection, and then license those patents out to third parties. Any resulting royalties would be divided according to a standard formula (e.g., 50/50) between the inventor and the foundation. To the extent the foundation receives funds beyond those needed to support its operating costs, those amounts would be reinvested in research at the university. As

2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2995672 [<https://perma.cc/NZ6J-7TBX>].

²⁵¹ See Henry C. Foley, *A New Approach to Intellectual Property Management and Industrially Funded Research at Penn State*, RESEARCH-TECH. MGMT 12, 16 (Sept.–Oct. 2012). A few years ago, Penn State decided to reverse its position that the university owned all IP resulting from industry-funded research. After reviewing licensing revenues and lost opportunities (failed negotiations with potential research partners), Penn State concluded that it would enjoy more opportunities to conduct industry-sponsored research, as well as deeper relationships between faculty and students and their industry counterparts, and could confer a greater economic benefit on society, by allowing industry sponsors to own intellectual property created in the course of such research. *Id.*

²⁵² This model may also be attractive to smaller colleges that do not have an organized technology transfer mechanism, since it would provide clarity for inventors and would relieve the school of any “obligation” to manage university IP.

²⁵³ One added benefit would be that universities would no longer be placed in a position of having to enforce their own patents, causing them to incur huge legal fees and to be characterized as nonpracticing entities or “trolls.” See Mark A. Lemley, *Are Universities Patent Trolls?*, 18 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 611, 612, 618 (2008).

one scholar commented about the WARF, “[w]ith this structure, business matters would not concern or distract the university from its educational mandate; yet academe could reap the rewards from a well-managed patent whose royalties would pay for other scientific work.”²⁵⁴

The university might elect to impose certain safeguards on the new system, however. For example, the university may determine that it is still necessary and desirable to require inventors to disclose their inventions to the university, so that it can document and track faculty productivity.²⁵⁵ If the university inventor does not take steps to commercialize the technology himself through a company in which he owns an interest or to license it to a third party within a reasonable time (to be defined by the university based on the circumstances of the particular case or its own general standards), then the university could intervene and request that the patent foundation take appropriate steps to patent and license the technology.²⁵⁶ These pseudo “march-in” rights would allow the university to ensure that the public benefits from university research and inventions, but it could also prevent valuable technologies from inadvertently entering the public domain where patenting appears to be a preferred option.²⁵⁷ Alternatively, in some circumstances, the inventors might affirmatively decide to place the invention in the public domain, and they could then notify the university of their intention to do so.²⁵⁸

With invention ownership and technology transfer moved out of the hands of the university, it would then be able to assume a more natural role in entrepreneurship efforts: the role of educator. The university would be able to reallocate funds previously used to support the technology transfer mission and instead use them to educate and assist university inventors.²⁵⁹ Specifically, the university could provide instructional programming on intellectual

²⁵⁴ MOWERY ET AL., *supra* note 70, at 39 (citing R.D. APPLE, VITAMANIA: VITAMINS IN AMERICAN CULTURE 42 (Rutgers Univ. Press 1996)).

²⁵⁵ Kenney & Patton, *supra* note 209, at 1413 (illustrating universities’ requirement that faculty members disclose their innovations despite their adverse incentives).

²⁵⁶ See Vertinsky, *supra* note 233, at 2016–17.

²⁵⁷ See generally *id.*

²⁵⁸ Kenney & Patton, *supra* note 209, at 1414.

²⁵⁹ *Id.* at 1419 (describing how universities have become so focused on raising revenue that they have put the goal of knowledge dissemination aside).

property rights and patenting, licensing, and creating and running a business entity. It might also be able to draw on internal programs at its business school to help entrepreneurial inventors with developing a business plan, and it can fund law school clinics and other programs to provide early assistance on intellectual property and business law issues.

The university might also be in a position to provide financial and research assistance to its startup companies.²⁶⁰ Some universities may wish to make direct investments in their startups in return for equity positions in the companies, or they might be in a position to introduce inventors to angel investors and venture capital firms.²⁶¹ Others may form university-startup partnerships that would help to further develop early stage technologies so that they can be commercialized more effectively, or they might create proof of concept centers (POCs) so that faculty inventors can demonstrate proof of concept for commercial applications of their inventions without relying on federally funded SBIRs and STTRs.²⁶² These efforts could potentially provide valuable learning experiences for students on issues like product development, which would be beneficial when they graduate and go to work in the industry.

In addition, universities could establish business incubators to house startups and provide them with access to office and laboratory space and administrative services.²⁶³ The incubators could attempt to negotiate bulk rates with accounting firms and law firms, making business and legal services (including patenting) more affordable for university inventors and startups.²⁶⁴ They might also be able to provide assistance with assembling management teams or make introductions to prospective technical employees.²⁶⁵ A number of universities already engage in many of these activities, and they generally do them well.²⁶⁶

²⁶⁰ Nag, *supra* note 225.

²⁶¹ *Id.*

²⁶² *Id.* (“[U]niversities [are] ... now taking active leadership in creating proof of concept funds and other funds where they are either the lead limited partner or catalyzing the raising of funds with the sole motivation of starting companies.”).

²⁶³ *Id.*

²⁶⁴ *See id.*

²⁶⁵ *Id.*

²⁶⁶ *Id.* (discussing how New York University, University of California, and University of Chicago have designated \$20 million, \$250 million, and \$25 million, respectively, for venture funds).

While this suite of services would not be inexpensive, they could be funded in part by partnerships with federal, state and local governments and economic development authorities. University entrepreneurs and incubator companies should also be expected to bear some portion of the cost through rental fees for incubator space or direct payment for services such as business development, legal fees, and special educational programming. For instance, the university might offer a course for entrepreneurs on starting and managing a high-tech startup company, for which it would charge tuition.

By allowing university inventors the option to retain ownership of their inventions and removing the technology transfer burden from the university, institutions of higher education would be able to focus on what they do best: providing education, research services, and support for entrepreneurial endeavors. Universities can then take a leading role in building a vibrant entrepreneurial ecosystem that builds trust between members of the university community, supports the efforts of industry partners, and contributes in a meaningful way to local and national economic development and growth.²⁶⁷

CONCLUSION

University positions on ownership of inventions made by faculty, staff, and students evolved gradually over the last 100 years, and today most universities claim that they own the inventive output of members of the university community.²⁶⁸ Often, their positions do not accurately reflect the state of the law, and members of the university may not even be aware that they cannot claim personal ownership of their patents and other inventions.²⁶⁹ In the short term, universities must revise their IP

²⁶⁷ Cummings, *supra* note 199, at 1039 (2014) (“The business model for this new century is an entrepreneurial university with a mission of economic development, in addition to research and teaching, and an interdisciplinary organizational structure that facilitates knowledge-based innovation.”). Cummings suggests that we give more ownership of inventions to colleges and their faculties, develop entrepreneurial programs that are aligned with business schools, and facilitate an ongoing collaboration with industry.

²⁶⁸ See, e.g., *Statement of Policy in Regard to Intellectual Property § 1(C)*, *supra* note 16.

²⁶⁹ Chew, *supra* note 19, at 289.

policies and practices to clarify that assignment of inventions is required as a term and condition of employment, and also to exempt tuition-paying students from the grasp of the policy. Going forward, universities may want to consider returning to their traditional role as educators and facilitators, while allowing inventors the option of owning their inventions or assigning them to a third-party patent foundation. Even if universities ultimately elect not to adopt the long-term proposal outlined herein, a renewed discussion of the questions and possible alternatives would be an important advancement in modernizing the standard model for ownership of university inventions.