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# Optimizing Expertise through Commercial Intellectual Property Achievement to Support Research Output Downstreaming: External Aspects in Policy Reform

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## Abstract

This study investigates the optimization of faculty expertise by leveraging commercial intellectual property (IP) achievements to facilitate the downstreaming of research outputs. It explores how universities can enhance their research impact and contribute to societal and economic development by effectively commercializing their intellectual assets. Emphasizing external aspects in policy reform, the research examines the intricate intersection of academia, industry, and

legal frameworks. By aligning academic endeavors with policy reform initiatives, universities can create a conducive environment for knowledge transfer and innovation diffusion. This paper underscores the significance of integrating commercial IP achievements into academic practices to bridge the gap between research and real-world applications. Through strategic partnerships with industry and effective utilization of legal mechanisms, universities can maximize the commercial potential of their intellectual assets. Furthermore, by fostering a culture of innovation and entrepreneurship among faculty members, universities can drive impactful research outcomes that address societal challenges and fuel economic growth. The findings suggest that policymakers play a crucial role in shaping the regulatory landscape to incentivize and support commercialization efforts within academia. By implementing policies that streamline IP management processes and provide adequate funding and infrastructure support, governments can foster a vibrant innovation ecosystem that promotes collaboration between academia and industry. Ultimately, this study advocates for a holistic approach to research commercialization that integrates academic, industrial, and policy perspectives to maximize societal benefits and promote sustainable development.

**Keywords** *Intellectual Property Rights, Policy Reform, Expertise*

## Introduction

It is commonly agreed that the commercialization of publicly funded research is one of the most substantial factors contributing to the national drive for economic growth and development.<sup>1</sup> Intellectual

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<sup>1</sup> Porto, Rafaella Guimarães, Rita Fernandes De Almeida, Oswaldo Cruz-Neto, Marcelo Tabarelli, Blandina Felipe Viana, Carlos A. Peres, and Ariadna Valentina Lopes. "Pollination ecosystem services: A comprehensive review of economic values, research funding and policy actions." *Food Security* 12, no. 6 (2020): 1425-1442; Saleh, Haeruddin, Batara Surya, Despry Nur Annisa Ahmad, and Darmawati Manda. "The role of natural and human resources on economic growth and regional development: With discussion of open innovation dynamics." *Journal of Open Innovation: Technology, Market, and Complexity* 6, no. 4 (2020): 103; Zakaria, Sana, Jonathon Grant, and Jane Luff. "Fundamental challenges in

property (IP) traditionally refers to the rights that exist in something that is the product of an original human intention or skill, intellect, and expertise, and not the rights that exist in the material thing.<sup>2</sup> As such, one could create and protect their IP rights in a wide array of subject matters such as trademarks, patents, trade secrets, industrial designs, or copyrights. The role of IP in the development and commercialization of new technological outputs emanating from publicly funded research projects has become increasingly prevalent in scholarly discourse.<sup>3</sup> Universities and public research organizations are discovering the importance of collaborating with private entities that have the required managerial skills and commercial acumen, and have a great interest in investing in the new knowledge results for successful research commercialization.<sup>4</sup>

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assessing the impact of research infrastructure." *Health Research Policy and Systems* 19 (2021): 1-9.

- <sup>2</sup> Dratler Jr, Jay, and Stephen M. McJohn. *Intellectual Property Law: Commercial, Creative and Industrial Property*. (Philadelphia: Law Journal Press, 2024); Neves, Pedro Cunha, et al. "The link between intellectual property rights, innovation, and growth: A meta-analysis." *Economic Modelling* 97 (2021): 196-209; Richards, Donald G. *Intellectual Property Rights and Global Capitalism: The Political Economy of the TRIPS Agreement: The Political Economy of the TRIPS Agreement*. (London: Routledge, 2020).
- <sup>3</sup> Fernández Pinto, Manuela. "Open science for private interests? how the logic of open science contributes to the commercialization of research." *Frontiers in Research Metrics and Analytics* 5 (2020): 588331; Muizniece, Lauma. "University autonomy and commercialization of publicly funded research: The case of Latvia." *Journal of the Knowledge Economy* 12 (2021): 1494-1516; Hillman, John R., and Elias Baydoun. "Innovation, creativity, and entrepreneurship in Academia: A review." *Higher Education in the Arab World: Building a Culture of Innovation and Entrepreneurship* (2020): 13-71.
- <sup>4</sup> O'Dwyer, Michele, Raffaele Filieri, and Lisa O'Malley. "Establishing successful university-industry collaborations: barriers and enablers deconstructed." *The Journal of Technology Transfer* 48, no. 3 (2023): 900-931; Rossoni, André Luis, Eduardo Pinheiro Gondim de Vasconcellos, and Renata Luiza de Castilho Rossoni. "Barriers and facilitators of university-industry collaboration for research, development and innovation: a systematic review." *Management Review Quarterly* 74, no. 3 (2024): 1841-1877; Ibeme, Nwamaka Patricia. "Effect of university-industry linkages on commercialization of innovations of higher education: evidence from Enugu State, South-East Nigeria." *International Journal of Development and Management Review* 15, no. 1 (2020): 96-126; Nsanzumuhire, Silas U., and Wim Groot. "Context perspective on University-Industry

Government funding provides a vital financial backbone for public research organizations in many modern settings, contributing to the success of many major research outputs.<sup>5</sup> However, one of the necessary contributions for successful public research commercialization is deemed to be the reliance on commercializing Intellectual Property (IP) as a preferred approach, particularly for firms not involved in R&D activities.<sup>6</sup> It provides a unique mechanism to manage knowledge spillovers and IP rights, and to capture the value of the innovative activities, thereby offering firms the flexibility to adapt their business models to changing market conditions in which they are embedded.<sup>7</sup>

However, in the business world, banking institutions consider the IP rights of universities and public research organizations to be primarily evaluated based on their market potential and demand for IP rights. Industry sectors, including pharmaceuticals, use IP rights as a priority basis for judging their interest in public research commercialization. The government promotes the commercialization of IP rights to ensure efficient economic growth. This often poses issues of how commercial IP rights actually enhance research output and where the rights of the commercial IP under public research are involved.<sup>8</sup>

At the further context, labels in science and ethical argument suggest four distinct moral questions that commercial IP might help

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Collaboration processes: A systematic review of literature." *Journal of Cleaner Production* 258 (2020): 120861.

<sup>5</sup> Smyth, Stuart J., Steven R. Webb, and Peter WB Phillips. "The role of public-private partnerships in improving global food security." *Global Food Security* 31 (2021): 100588; Ravšelj, Dejan, et al. "A review of digital era governance research in the first two decades: a bibliometric study." *Future Internet* 14.5 (2022): 126.

<sup>6</sup> Dratler Jr, and McJohn. *Intellectual Property Law: Commercial, Creative and Industrial Property*; Grimaldi, Michele, Marco Greco, and Livio Cricelli. "A framework of intellectual property protection strategies and open innovation." *Journal of Business Research* 123 (2021): 156-164.

<sup>7</sup> Mavroudi, Eva, et al. "How can MNEs benefit from internationalizing their R&D across countries with both weak and strong IPR protection?." *Journal of International Management* 29, no. 1 (2023): 100994; Ma, Lei, et al. "Digital enabled innovation ecosystems: a dual case study of knowledge flows in intellectual property platforms." *European Journal of Innovation Management* (2024).

<sup>8</sup> Neves, et al. "The link between intellectual property rights, innovation, and growth: A meta-analysis"; Law, Siong Hook, Tamat Sarmidi, and Lim Thye Goh. "Impact of innovation on economic growth: Evidence from Malaysia." *Malaysian Journal of Economic Studies* 57, no. 1 (2020): 113-132.

address: (a) the authenticity question concerning innovation outcomes; (b) the motivational question concerning why agents innovate; (c) the distribution question concerning moral justice; and (d) the progress question concerning how much innovation occurs.<sup>9</sup> The role of commercial IP in addressing each of these questions can be understood through a conceptual framework that emphasizes its multiple 'tool-like' functions.<sup>10</sup> Engagement with the framework suggests that the strategic use of commercial IP is an evolving characteristic of robust innovation environments—a complement and not just a substitute for government support.<sup>11</sup> Its ability to mix incentives and protection in creative ways gives researchers and other IP stakeholders a powerful contribution to make to ongoing debates on direct government science funding and also to the governance of related challenges such as the pandemic-inspired technology and diplomacy crisis that is bidding to damage both economic growth and pluralistic cooperative norms.

## Expanding the Realm of Commercial Intellectual Property Rights

Interest is increasingly focused on a variety of forms of hybrid regulation that, rather than standing either within or alongside markets, lead markets themselves to take a variety of values and potentially

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<sup>9</sup> Mann, Sebastian Porsdam, Helle Porsdam, and Yvonne Donders. "' Sleeping beauty": The right to science as a global ethical discourse." *Human Rights Quarterly* 42, no. 2 (2020): 332-356; Bietti, Elettra. "From ethics washing to ethics bashing: a moral philosophy view on tech ethics." *Journal of Social Computing* 2, no. 3 (2021): 266-283; Bernstein, Michael S., et al. "Ethics and society review: Ethics reflection as a precondition to research funding." *Proceedings of the National Academy of Sciences* 118, no. 52 (2021): e2117261118.

<sup>10</sup> Ewing, Thomas L. *Exploring the Boundaries of Patent Commercialization Models Via Litigation*. (Sweden: Chalmers Tekniska Hogskola, 2022).

<sup>11</sup> Wang, Tao, Xue Yu, and Nan Cui. "The substitute effect of internal R&D and external knowledge acquisition in emerging markets: an attention-based investigation." *European Journal of Marketing* 54, no. 5 (2020): 1117-1146; Shmeleva, Nadezhda, et al. "Challenges and opportunities for technology transfer networks in the context of open innovation: Russian experience." *Journal of Open Innovation: Technology, Market, and Complexity* 7, no. 3 (2021): 197.

community-oriented goals into account.<sup>12</sup> Formally, the premise of these examinations is that privately enforced investment agreements leave parties free to transact in order to hedge against difficult-to-observe quality differences.<sup>13</sup> This protection, in turn, secures the informational content of otherwise weakly contestable transactions, thereby potentially offering alternative or broader meanings of wealth and prosperity.<sup>14</sup> This paper examines a particular set of such transactions, through which commercial intellectual property rights—patents, trade secrets, and even contracts—are deployed to express and to lay claim to the information contained in research findings that modify truth claims or policy recommendations.

By providing researchers with previously non-existent futures markets through which to value their current choices, as well as researchers, policymakers, businesses, and others with more information about those choices, intellectual property rights help in meeting two key characteristics of a discovery process within which researchers are all able to decide what additional data to collect and what extra problems to attack only if all the relevant information the use of resources will not be concentrated in the hands of a few.<sup>15</sup> Because information and the attention of those who possess it can be freely exchanged by property rights, the researched community is potentially larger and more dispersed than is the control and rewards of formal property rights

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<sup>12</sup> Magni, G. U., et al. "How national policies influence energy community development across Europe? A review on societal, technical, and economical factors." *Energy Conversion and Management: X* (2024): 100624.

<sup>13</sup> Klausner, Michael, and Guhan Subramanian. *Deals: The Economic Structure of Business Transactions*. (Cambridge, MA: Harvard University Press, 2024); Zhang, Hailun. "Non-R&D innovation in SMEs: is there complementarity or substitutability between internal and external innovation sourcing strategies?." *Technology Analysis & Strategic Management* 36, no. 5 (2024): 916-930.

<sup>14</sup> Lawrence, Mathew, and Adrienne Buller. *Owning the future: Power and property in an age of crisis*. (London: Verso Books, 2022); Weymouth, Stephen. *Digital Globalization: Politics, Policy, and a Governance Paradox*. (Cambridge: Cambridge University Press, 2023).

<sup>15</sup> Dratler Jr, and McJohn. *Intellectual Property Law: Commercial, Creative and Industrial Property*. See also Abbott, Frederick M., et al. *International Intellectual Property in an Integrated World Economy*. (Waltham, MA: Aspen Publishing, 2024).

holders.<sup>16</sup> Yet these rights are also about risk and its consequences. As such, they are as much about potential future policies as past knowledge.

In addition, commercially oriented research and the development of intellectual property have long been the main source of financial benefits to universities and other publicly funded R&D institutions.<sup>17</sup> In other countries, particularly the USA, patenting of new inventions by universities contributes significantly to the level of commercial activity in their host regions.<sup>18</sup> Governments provide financial support to publicly funded R&D institutions to enhance research output. It is a long-established view that commercial product development is not the primary focus of R&D in universities, but that universities contribute to this development by providing knowledge spillovers to industry.<sup>19</sup>

There are genuine concerns as to whether commercial reward for the creation of intellectual property has become the dominant motivation driving scientific and technological research.<sup>20</sup> A key concern is that within the traditional educational and research roles of universities, scientists and other researchers have a responsibility to think about the accumulation of knowledge as a public good. Researchers should be engaged in the creation of knowledge and should

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<sup>16</sup> McClintock, Cynthia. "Property without Rights: Origins and Consequences of the Property Rights Gap. By Michael Albertus. New York: Cambridge University Press, 2021. 416p. 29.99 paper." *Perspectives on Politics* 19, no.4 (2021): 1349-1351.

<sup>17</sup> Ismail, Norain, et al. "From innovation to market: Integrating university and industry perspectives towards commercialising research output." *Forum Scientiae Oeconomia* 8, no. 4 (2020): 99-115; Ravi, Ramya, and Manthan D. Janodia. "Factors affecting technology transfer and commercialization of university research in India: A cross-sectional study." *Journal of the Knowledge Economy* 13, no. 1 (2022): 787-803.

<sup>18</sup> Brantnell, Anders, and Enrico Baraldi. "Understanding the roles and involvement of technology transfer offices in the commercialization of university research." *Technovation* 115 (2022): 102525.

<sup>19</sup> Ahn, Joon Mo, Weonvin Lee, and Letizia Mortara. "Do government R&D subsidies stimulate collaboration initiatives in private firms?." *Technological Forecasting and Social Change* 151 (2020): 119840.

<sup>20</sup> Boyte, Alina Ng. "The Social Value of Intellectual Property." *IP Theory* 12, no. 3 (2022); Blind, Knut, Ellen Filipović, and Luisa K. Lazina. "Motives to publish, to patent and to standardize: an explorative study based on individual engineers' assessments." *Technological Forecasting and Social Change* 175 (2022): 121420.

disseminate that knowledge to as wide an audience as possible.<sup>21</sup> A range of public policy measures have been initiated by governments to encourage greater focus on commercial objectives in research outputs. These policies include changes to patent legislation to permit and regulate the ownership of discoveries arising out of publicly funded research to a specific commercialization body established for that purpose.<sup>22</sup>

## Historical Perspectives on IP and Research

Records of modern patent systems commenced about 400 years ago. The origins of modern patent systems can be traced back to the Venetian Statute of 1474. The patent system of the Venetian Republic was the first national system and gave certain inventors a temporary legal monopoly.<sup>23</sup> In exchange for full disclosure of an invention, the state protected the holder of a patent against imitation for a certain period of time.<sup>24</sup> The aim was to encourage the flow of technological information and migration. The Statute of Monopolies was passed in England about 100 years later in response to the widespread use of royal patents, which often excluded some type of knowledge or market. The general principle of the Statute of Monopolies was that an invention must be novel to be patented.<sup>25</sup>

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<sup>21</sup> Rüfenacht, Simone, et al. "Communication and dissemination in citizen science." *The Science of Citizen Science* 475 (2021): 520.

<sup>22</sup> See Sørensen, Eva. "Political innovations: innovations in political institutions, processes and outputs." In *Political Innovations*. (London: Routledge, 2020), pp. 1-19; Leckel, Anja, Sophie Veilleux, and Leo Paul Dana. "Local Open Innovation: A means for public policy to increase collaboration for innovation in SMEs." *Technological Forecasting and Social Change* 153 (2020): 119891; Valle-Cruz, David, et al. "Assessing the public policy-cycle framework in the age of artificial intelligence: From agenda-setting to policy evaluation." *Government Information Quarterly* 37, no. 4 (2020): 101509.

<sup>23</sup> Ilić, Nikola. "Understanding Patents: Historical and Legal Aspects." *Law and Economics of Patents: Theory, Economic Impact, and Future Trends*. (Cham: Springer Nature Switzerland, 2024), pp. 9-29.

<sup>24</sup> Onyeagbako, Victoria. "Justifications for Copyright and Patents Protection." *Available at SSRN 3596193* (2020).

<sup>25</sup> Rikap, Cecilia. *Capitalism, Power and Innovation: Intellectual Monopoly Capitalism Uncovered*. (London: Routledge, 2021); Michaels, Andrew C. "Benefits of the Invention and Social Value in Patent Law." *George Mason Law Review* 29, no. 3 (2022).



Gradually, commercial exploitation of intellectual property became more organized and powerful as a result of structural changes connected with the Industrial Revolution.<sup>26</sup> The Industrial Revolution led to the emergence of modern market economies, improvements in transport, and associated product life.<sup>27</sup> The entire system of patents and trademarks has affected the world of medical research in the last 50 years in several respects.<sup>28</sup> A specialized agency of the United Nations deals with the promotion of responsible use of intellectual property for the benefit of everyone. This body administers about 25 international intellectual property treaties and offers a global intellectual property protection system.<sup>29</sup>

### The Impact of IP on Innovation

Given the implications of IP policy for innovation, what has emerged in the empirical literature? Scholars have adopted a range of approaches to estimate the impact of IP on innovation. One study estimated the impact of patents on six types of R&D expenditure and found the biggest impact related to its capacity to protect commercial secrecy, while it performed better than copyright protection in protecting new products, knowledge, and company image.<sup>30</sup> Reduced-form approaches, usually based on regression analysis, have also been adopted.

Many of these studies are based on high-quality datasets. Typically, these studies have focused on whether firms that obtain patents are more innovative than firms that do not. While the empirical findings of this literature are often only applicable to certain years or

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<sup>26</sup> Malkin, Anton. "The made in China challenge to US structural power: Industrial policy, intellectual property and multinational corporations." *Review of International Political Economy* 29, no. 2 (2022): 538-570.

<sup>27</sup> Rymarczyk, Jan. "The impact of industrial revolution 4.0 on international trade." *Entrepreneurial Business and Economics Review* 9, no. 1 (2021): 105-117.

<sup>28</sup> Singh, Bhupinder, et al. "The effect of TRIPS implementation on Indian patent law: A pharmaceutical industry perspective: With special reference to healthcare industry." *Journal of Pharmaceutical Negative Results* (2022): 976-981.

<sup>29</sup> Auriol, Emmanuelle, et al. "Intellectual property rights protection and trade: An empirical analysis." *AFD Research Papers* 240 (2022): 1-67.

<sup>30</sup> Gross, Daniel P. "The hidden costs of securing innovation: the manifold impacts of compulsory invention secrecy." *Management Science* 69, no. 4 (2023): 2318-2338.

industries, some consistently emerge. Using these approaches, it was found that patenting has a positive and significant impact on knowledge transfers and that this has increased over time.<sup>31</sup> In contrast, other authors find that external knowledge sourcing through licensing, joint ventures, and acquisitions is less a substitute for in-house R&D but rather a complement to it. Some address this conundrum by treating external knowledge sourcing as a separate outcome and thus find evidence of a substitution effect.<sup>32</sup> However, these contradictory findings leave unresolved the fundamental question of the impact of commercial IP on firms' innovation.<sup>33</sup>

It is argued that at the point of invention, firms, not scholars, are the experts and can inform research by detailing how commercial IP specifically relates to individual inventions whose disclosure, novelty, and technical solution become part of the knowledge base.<sup>34</sup> Whether the firm exploits the invention or not, they need carefully to articulate their aims with respect to the invention to be granted a patent.<sup>35</sup> The structure of claims in patents also provides further insights: the literature suggests that the broader the technological scope of protection sought, the more strategic the invention must be for the firm.<sup>36</sup> In that case, the presence of IP on such discoveries would protect the company's as yet

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<sup>31</sup> Jin, Peizhen, Sachin Kumar Mangla, and Malin Song. "The power of innovation diffusion: How patent transfer affects urban innovation quality." *Journal of Business Research* 145 (2022): 414-425; Scarrà, Deepa, and Andrea Piccaluga. "The impact of technology transfer and knowledge spillover from Big Science: a literature review." *Technovation* 116 (2022): 102165.

<sup>32</sup> Delgado-Verde, Miriam, et al. "Complements or substitutes? The contingent role of corporate reputation on the interplay between internal R&D and external knowledge sourcing." *European Management Journal* 39, no. 1 (2021): 70-83.

<sup>33</sup> Searle, Nicola. "The economic and innovation impacts of trade secrets." *UK Intellectual Property Office Research Paper* 2021/01 (2021).

<sup>34</sup> Vinokurova, Natalya, and Rahul Kapoor. "Converting inventions into innovations in large firms: How inventors at Xerox navigated the innovation process to commercialize their ideas." *Strategic Management Journal* 41, no. 13 (2020): 2372-2399. See also Khan, B. Zorina. *Inventing ideas: patents, prizes, and the knowledge economy*. (Oxford: Oxford University Press, 2020).

<sup>35</sup> Sandrik, Karen E. "Distinctly Claiming an Invention." *SMU Law Review* 73, no. 3 (2020): 541.

<sup>36</sup> Noh, Heeyong, and Sungjoo Lee. "What constitutes a promising technology in the era of open innovation? An investigation of patent potential from multiple perspectives." *Technological Forecasting and Social Change* 157 (2020): 120046.

unfulfilled intentions for the invention, usually including protection and licensing strategies, and thus greatly enhance the possibility of the invention coming to fruition as a useful product or service for society's benefit.<sup>37</sup> If its projections of revenues from licensing are not generous, the firm need not engage in expensive R&D if licensing revenues do not materialize; society should compare and contrast the risk-adjusted benefits and costs of commercial innovation through firms against those of alternative methods such as public support and central funding.<sup>38</sup> In addition, are invention disclosures for patents whose strength is in inventive extension different from invention disclosures for patents for inventions that are not in firms' core competency but are strategic for their business?

## IP and Policy Reform

### A. *Indonesian National Policies*

In the context of Indonesia's national policy for Intellectual Property (IP) Law, the country is rigorously committed to providing exponentially increased opportunities for scientific researchers. Recognizing the paramount and indispensable role of science in the overall development of the nation, the government's strategic focus is extensively outlined in a multitude of comprehensive national planning documents such as the Third National Long-Term Development Plan and Vision 2020, which serve as foundational pillars for the nation's progress. Furthermore, higher education and research play an intricately crucial role at the core of this national policy, acting as a catalytic force for innovation, societal transformation, and the holistic development of highly qualified and competent human resources

The august government wholeheartedly acknowledges that human resources constitute the most invaluable asset, thereby placing an unwavering emphasis on the absolute necessity for professional, efficient, and utterly transparent operations within the realm of higher

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<sup>37</sup> Walsh, Karen, et al. "Intellectual property rights and access in crisis." *IIC-International Review of Intellectual Property and Competition Law* 52 (2021): 379-416.

<sup>38</sup> Nguyen, Thanh, Son Nghiem, and Abhishek Singh Bhati. "Risk-adjusted efficiency and innovation: an examination of systematic difference and convergence among BRIC banks." *Economic Systems* 48, no. 1 (2024): 101167.

education and research. In line with this philosophy, the government ardently propagates the promotion of decentralized operations and greater autonomy for individual institutions, acting as strong catalysts to facilitate an environment of dynamic and balanced growth

Additionally, it is crucial to allocate and mobilize supplementary resources to comprehensively address the expansion and reform requirements of the sector, while concurrently fostering professional administrative practices that guarantee the utmost efficacy in resource management. Enhancing the foundation of collaboration among various stakeholders is unequivocally indispensable as it serves as the quintessential driving force to conjure a fiercely competitive environment that unabashedly encourages and propels innovation and excellence. This collaborative approach ensures that the needs and aspirations of all involved parties are diligently met, creating a harmonious ecosystem that nurtures and fosters unparalleled advancement and development. It is upon this bedrock of cooperation, dedication, and synergy that Indonesia's national policy for IP Law firmly stands, paving the way for a future brimming with scientific breakthroughs and transformative discoveries that will indubitably shape the destiny of the nation.<sup>39</sup>

## ***B. International Agreements***

In the area of the protection of intellectual property, substantive changes in the way the rules were applied were made through the 1986 Paris Convention and the 1994 Agreement on Trade-Related Aspects of Intellectual Property Rights.<sup>40</sup> Two substantive changes that apply to the relationship of the patent and other substantial rules relate to: *first*, the standard of patent protection that national patent offices must accord all patents as inventions in all fields of technology, with the only exceptions of a few areas of non-patentability, and *second*, the compulsory licensing of patents in case of abuse or non-use of patents,

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<sup>39</sup> Sujaini, Herry. "Digital Transformation in Protecting Intellectual Property Rights in Indonesia." *Russian Law Journal* 11, no. 4 (2023): 259-270; Hanafi, Imam, and Arief Fahmi Lubis. "Protection of Privacy and Intellectual Property Rights in Digital Data Management in Indonesia." *The Easta Journal Law and Human Rights* 2, no. 1 (2023): 33-40.

<sup>40</sup> See Correa, Carlos. *Trade related aspects of intellectual property rights: a commentary on the TRIPS agreement*. (Oxford: Oxford University Press, 2020).

as well as the rules that govern the conditions linked to it. The relevant provisions confine the benefit of patent protection related to inventions to patents that can or cannot be obtained for living beings of human societies, while also excluding from the class of inventions not patentable certain types of patents.<sup>41</sup> Thus, the patents that must be allowed are defined within a framework of patents that are recognized by the invention. The rights of patent holders are protected.<sup>42</sup> The law of patents must, however, comply with these basic rights, which implies that anyone who can provide proof of a legitimate claim may request that the law of patents uphold these rights. The law of patents as a whole, i.e., the positive provisions of the patent grant, laid down in a written patent and outlining the rights of patentees, operates independently from the laws of other countries and the types and conditions subject.

The adaptation and enforcement of intellectual property laws have gained significant importance in recent years, given the rapid advancements in technology and the global nature of commerce.<sup>43</sup> As a result, international agreements such as the Paris Convention and the Agreement on Trade-Related Aspects of Intellectual Property Rights have been pivotal in establishing cohesive frameworks for patent protection.<sup>44</sup> One essential substantive change brought about by these agreements is the universal standard of patent protection that national patent offices must uphold.<sup>45</sup> This standard ensures that all patents,

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<sup>41</sup> Song, Haoyang, Jianhua Hou, and Yang Zhang. "Patent protection: does it promote or inhibit the patented technological knowledge diffusion?." *Scientometrics* 127, no. 5 (2022): 2351-2379.

<sup>42</sup> Melero, Eduardo, Neus Palomeras, and David Wehrheim. "The effect of patent protection on inventor mobility." *Management Science* 66, no. 12 (2020): 5485-5504.

<sup>43</sup> Anderson, Robert D., Nuno Pires de Carvalho, and Antony Taubman, eds. *Competition policy and intellectual property in today's global economy*. (Cambridge: Cambridge University Press, 2021).

<sup>44</sup> Athreye, Suma, Lucia Piscitello, and Kenneth C. Shadlen. "Twenty-five years since TRIPS: Patent policy and international business." *Journal of International Business Policy* 3, no. 4 (2020): 315.

<sup>45</sup> Dreyfuss, Rochelle, and Jerome Reichman. "WIPOs role in procedural and substantive patent law harmonization." In *Research Handbook on the World Intellectual Property Organization*. (Cheltenham, UK: Edward Elgar Publishing, 2020), pp. 108-130.

regardless of their field of technology, receive equal protection, with only a few exceptions pertaining to non-patentable areas.<sup>46</sup>

By setting this standard, the international community aims to encourage innovation and safeguard the rights of inventors on a global scale. Another significant change lies in the provisions for compulsory licensing of patents, which come into effect when an abuse or non-use of patents is identified. These provisions outline the conditions under which patents can be licensed to other parties, emphasizing the need for patent holders to actively utilize their inventions for the benefit of society. This measure aims to prevent monopolistic practices and promote the dissemination of knowledge. Furthermore, the scope of patentable inventions has also been refined to ensure that certain categories, such as living beings, are adequately addressed. While inventions related to human societies remain eligible for patent protection, certain types of patents are explicitly excluded from patentability.

This approach strikes a balance between incentivizing innovation and respecting ethical considerations. To ensure the effectiveness of patent laws, it is crucial that the rights of patent holders are protected. The law of patents must align with fundamental rights, allowing individuals with legitimate claims to seek redress and uphold their rights. By establishing a robust framework that safeguards these rights, patent systems can foster a fair and competitive environment for innovation. It is important to note that patent laws operate independently, encompassing positive provisions outlined in written patents. These provisions define the rights granted to patentees and establish a comprehensive framework that operates within national jurisdictions. While harmonization among different countries is encouraged, each jurisdiction retains the autonomy to shape their specific patent laws according to their unique circumstances and needs.

## Conclusion

Optimizing intellectual property (IP) through commercial achievements in higher education is essential for enhancing the impact

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<sup>46</sup> Sterzi, Valerio, Jean-Paul Rameshkoumar, and Johannes Van Der Pol. "Non-practicing entities and transparency in patent ownership in Europe." *Technical Report* (2020).

of research in Indonesia. By fostering a robust ecosystem that supports the translation of research into marketable innovations, Indonesia can harness the full potential of its academic resources. Effective policy reforms—focused on streamlining IP regulations, encouraging industry-academia collaboration, providing incentives for researchers, and enhancing education on IP management—are critical for overcoming existing barriers to commercialization. Addressing these challenges will not only improve the rate of downstreaming research outputs but also position Indonesia as a competitive player in the global innovation landscape.

Ultimately, the integration of IP strategy into the research agenda of higher education institutions will drive economic growth, enhance societal benefits, and promote sustainable development. By investing in the necessary infrastructure, resources, and training, Indonesia can unlock a wealth of opportunities that stem from its rich reservoir of research and innovation.

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